BSc

Syllabuses and Regulations

2020-2021

Faculty of ScienceThe University of Hong Kong

General Information

This booklet includes information on:

BSc Degree curriculum and graduation requirements

> List of courses and descriptions

A full list of Science courses and descriptions include information on course code, title, credit value, contents, semester offered, teaching and learning activities, assessment methods and grade descriptors.

Majors & Minors

Details of the Science Majors and Minors available for students.

> Degree regulations

Rules that cover curriculum requirements and progression in curriculum, selection of courses, assessment, advanced standing, grading system and degree honours classification.

> Teaching weeks

Teaching weeks show the dates of semesters, University holidays, revision and examination periods.

Further Information detailing instructions on the selection of courses, grading, graduation requirements, honours classification, application for advanced standing and exemption, etc, can be found in the *Handbook for BSc Students* available at http://www.scifac.hku.hk/ug/current

Updates on BSc Syllabuses and Regulations can be found at http://webapp.science.hku.hk/sr4/servlet/enquiry

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BSc Degree Curriculum and

Graduation Requirements

SECTION I BSc Degree Curriculum and Graduation Requirements

1. A BSc Degree Curriculum

The Faculty of Science offers a number of Science majors leading to the award of a BSc degree.

All students admitted to the first year of the 6901 BSc programme in the academic year of 2020-2021 and thereafter are required to complete at least one Science major out of the 14 regular or 7 intensive Science majors as your primary major for the award of the BSc degree. In addition to the primary Science major, students may take a second major or a minor in a Science or non-Science discipline. Students should note that some non-Science majors and minors may require students to have achieved a minimum academic result before they are allowed to enroll in them.

(a) A typical BSc curriculum for students admitted under the 4-year curriculum

To complete the BSc degree curriculum, you have to pass at least 240 credits, equivalent to 40 6-credit courses, normally spread over 4-years of full-time study. A BSc curriculum typically comprises:

(i) UG5:

- 2 English courses and 1 Chinese course for university language requirements (18 credits)
- 6 common core courses in 4 Areas of Inquiry (36 credits)

(ii) For regular Science major:

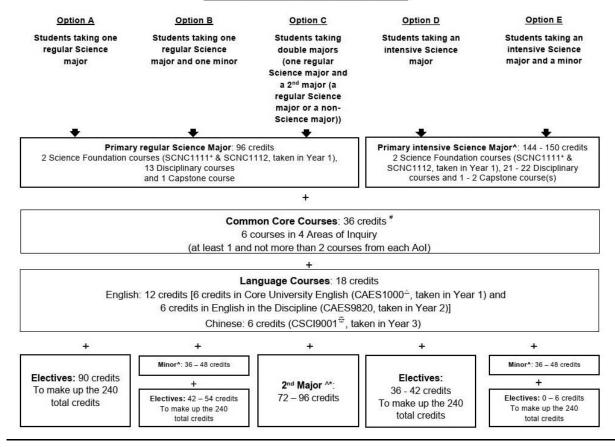
- 16 courses for the regular Science major including 2 Science Foundation courses, Disciplinary courses and capstone course (96 credits)
- A choice of 15 courses as elective courses, or to fulfill the requirements of a minor or a second major (90 credits)

OR

For intensive Science major (applicable to 2015-16 intake and thereafter):

- 24 25 courses for the intensive Science major including 2 Science Foundation courses, Disciplinary courses and capstone course(s) (144 150 credits)
- A choice of 6 7 courses as elective courses, or to fulfill the requirements of a minor (36 42 credits)

Curriculum requirements (240 credits)



Notes

⁺ Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following

qualifications are exempted from taking SCNC1111:

- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

It is optional for them to take the course SCNC1111. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.

- Student must select at least one and not more than two courses from each Area of Inquiry with not more than 24 credits of courses being selected within one academic year except where candidates are required to make up for failed credits. Common Core courses should be completed normally within the first three years of study.
- △Students who have been admitted to Year 1 in 2018-19 (and thereafter) and have achieved any one of the following qualifications are exempted from this requirement, and Core University English is optional. Those who do not take this course should take a 6-credit elective course in lieu:
 - Level 5 or above in English Language in the HKDSE
 - holder of a Bachelor's degree from an English-medium university
 - achieved Grade A or above in English Language GCE Advanced Level (AL) / Advanced Subsidiary Level (ASL)
 - achieved an overall **IELTS** score of no less than 7 <u>AND</u> with all sub-scores no less than 6.5 on the Reading, Speaking, Listening and Writing Tests
 - achieved an overall **TOEFL Internet-based test** score of no less than 94 <u>AND</u> no less than a 24 on the writing, a 20 on the speaking, a 20 on the listening, AND a 19 on the reading sections
 - achieved in **International Baccalaureate (IB)** Grade 4 or above in English A1/ English Language A/ English A: Literature/ English A: Language and Literature (HL); or Grade 5 or above in English B/ English Language B (HL); or Grade 5 or above in English A1/ English Language A/ English A: Literature/ English A: Language and Literature (SL)
 - achieved Grade 4 or above on the Advanced Placement (AP) English Language/ English Language and Composition/ English Literature and Composition Test
 - achieved a **NEW Scholastic Aptitude Test (SAT)** score of 35 or above on <u>both</u> the Writing & Language Test <u>and</u> Reading Test (from 2016)
 - achieved Grade B or above in H1 General Paper at the Singapore GCE A-level
 - achieved Grade A or better in English language at Malaysia SPM examination
 - achieved Grade A2 or better in Malaysia UEC-Senior English Language
 - attained merit (3 points) or above in each set of credits in **New Zealand NCEA Literacy** (10 credits made up of 5 credits in reading and 5 credits in writing)
 - achieved a score of 95% or better in English at All India Senior School Certificate Examination / Higher School Certificate
 - achieved a final score of 90% or better in English at Grade 12 Canadian high school curriculum
 - achieved Grade B or better in English Language at Sri Lanka Ordinary examination
 - achieved a score of 90 or better in English in the **Russian Unified State Exam** (Единый государственный экзамен, ЕГЭ, Yediniy gosudarstvenniy ekzamen, EGE)
 - Academic Speaking and Writing test conducted by CAES for students who have not taken any of the above tests
 - > When applying to take the Academic Speaking and Writing Test, students should provide evidence to the home Faculty and the CAES1000 Course Coordinator that they were admitted to HKU using qualifications other than those included in the above list.
 - > Applicants are required to show the evidence of those other qualifications to the assessor on the day of the Academic Speaking and Writing Test.
 - If any applicants failed to provide any evidence that they were admitted to HKU using qualifications other than those included in the above list provided by CAES, the CAES assessor has the rights not to allow the applicant to take the test.
- [‡] To satisfy the Chinese language enhancement requirement, students are required to successfully complete the 6-credit Faculty-specific Chinese language enhancement course, except for:
 - (a) Putonghua-speaking students who should take CUND9002 (Practical Chinese and Hong Kong Society) or CUND9003 (Cantonese for Non-Cantonese Speaking Students). They may take the course in Year 1 or 2 if they so wish; and
 - (b) students who have not studied Chinese language during their secondary education or who have not attained the requisite level of competence in the Chinese language to take the Chinese language enhancement course should write to the Board of the Faculty to apply to be exempted from the Chinese language requirement, and
 - (i) take a 6-credit Cantonese or Putonghua language course offered by the School of Chinese especially for international and exchange students; OR
 - (ii) take an elective course in lieu.
- ^ Credit requirement for different majors or minors may vary.
- * Students having a second major in Science are allowed to double-count the two Science Foundation Courses. The 12 credits can be made up by selecting any courses.

(b) Common Core Curriculum

The Common Core Curriculum is designed to provide key common learning experience for all HKU students and to broaden their horizons beyond their chosen disciplinary fields of study. It focuses on issues that have been, and continue to be, of deeply profound significance to mankind, the core intellectual skills that all HKU undergraduates should acquire and the core values that they should uphold. The Common Core Curriculum is divided into four Areas of Inquiry (AoIs): (1) Scientific and Technological Literacy; (2) Humanities; (3) Global Issues; (4) China: Culture, State and Society. Students have to pass 36 credits of courses in the Common Core Curriculum, comprising at least one and not more than two courses from each Area of Inquiry with not more than 24 credits of courses being selected within one academic year except where candidates are required to make up for failed credits. Common Core courses should be completed normally within the first three years of the BSc study and cannot be extra taken as free electives.

2. BSc Graduation Requirements and Honours Classification

(a) Award of a BSc degree

For students admitted to the first year in 2014-15 or before, and students admitted directly in the third year in 2016-17 or before:

To be eligible for the award of the degree of Bachelor of Science, students must fulfill the following requirements:

- (i) Satisfied the requirements in UG5 of the Regulations for First Degree Curricula#;
- (ii) Passed not fewer than 240 credits, comprising 96 credits of the required courses as prescribed in the major programme of the BSc degree curriculum.
- # UG5 specifies that students have to successfully complete:
 - (a) 12 credits in English language enhancement, including 6 credits in Core University English¹ (i.e. CAES1000) and 6 credits in an English in the Discipline course² (i.e. CAES9820 Academic English for Science Students);
 - (b) 6 credits in Chinese language enhancement³ (i.e. CSCI9001 Practical Chinese for Science Students);
 - (c) 36 credits of courses in the Common Core Curriculum, comprising at least one and not more than two courses from each Area of Inquiry⁴ with not more than 24 credits of courses being selected within one academic year except where candidates are required to make up for failed credits; and
 - (d) a capstone experience as specified in the syllabuses of the degree curriculum.

For students admitted to the first year in 2015-16, 2016-17 and 2017-18, students admitted directly to the second year in 2017-18 and 2018-19, and students admitted directly to the third year in 2017-18, 2018-19 and 2019-2020:

To be eligible for the award of the degree of Bachelor of Science, students must fulfill the following requirements:

- (i) Satisfied the requirements in UG5 of the Regulations for First Degree Curricula*;
- (ii) Passed not fewer than 240 credits, comprising 96 credits of the required courses as prescribed in the regular major programme, or 144 credits (or a higher credit requirement by the accredited bodies) of the prescribed course in the intensive major programme, of the BSc degree curriculum.
- # UG5 specifies that students have to successfully complete:
 - (a) 12 credits in English language enhancement, including 6 credits in Core University English¹ (i.e. CAES1000) and 6 credits in an English in the Discipline course² (i.e. CAES9820 Academic English for Science Students);
 - (b) 6 credits in Chinese language enhancement³ (i.e. CSCl9001 Practical Chinese for Science Students);
 - (c) 36 credits of courses in the Common Core Curriculum, comprising at least one and not more than two courses from each Area of Inquiry⁴ with not more than 24 credits of courses being selected within one academic year except where candidates are required to make up for failed credits; and
 - (d) a capstone experience as specified in the syllabuses of the degree curriculum.

For students admitted to the first year in 2018-19 and thereafter, and students admitted directly to the second year in 2019-20 and thereafter:

To be eligible for the award of the degree of Bachelor of Science, students must fulfill the following requirements:

- (i) Satisfied the requirements in UG5 of the Regulations for First Degree Curricula#;
- (ii) Passed not fewer than 240 credits, comprising 96 credits of the required courses as prescribed in the regular major programme, or 144 credits (or a higher credit requirement by the accredited bodies) of the prescribed course in the intensive major programme, of the BSc degree curriculum.
- [#] UG5 specifies that students have to successfully complete:
 - (a) 12 credits in English language enhancement, including 6 credits in Core University English¹ (i.e. CAES1000) and 6 credits in an English in the Discipline course² (i.e. CAES9820 Academic English for Science Students OR CAES9821 Professional and Technical Communication for Mathematical Sciences);
 - 6 credits in Chinese language enhancement³ (i.e. CSCI9001 Practical Chinese for Science Students);
 - (c) 36 credits of courses in the Common Core Curriculum, comprising at least one and not more than two courses from each Area of Inquiry⁴ with not more than 24 credits of courses being selected within one academic year except where candidates are required to make up for failed credits; and

CCDA range

(d) a capstone experience as specified in the syllabuses of the degree curriculum.

(b) Honours Classification

For students admitted to the first year in 2016-17 or before, students admitted directly to the second year in 2017-18, and students admitted directly to the third year in 2018-19 or before:

Classification of honours are calculated using the cumulative grade point average CGPA as below:

	CGPA range
First Class Honours	3.60 - 4.30
Second Class Honours Division I	3.00 - 3.59
Second Class Honours Division II	2.40 - 2.99
Third Class Honours	1.70 - 2.39
Pass	1.00 - 1.69

For students admitted to the first year in 2017-18 and thereafter, students admitted directly to the second year in 2018-19 and thereafter, and students admitted directly to the third year in 2019-2020 and thereafter:

Classification of honours are calculated using the graduation grade point average GGPA* as below:

	CGPA range
First Class Honours	3.60 - 4.30
Second Class Honours Division I	3.00 - 3.59
Second Class Honours Division II	2.40 - 2.99
Third Class Honours	1.70 - 2.39
Pass	1.00 - 1.69

* For students in the 2017-18 intake and thereafter who have successfully completed six Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five Common Core courses with the highest grades (covering all four Areas of Inquiry), or all six courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA.

Credits granted for advanced standing in recognition of studies completed successfully before admission to the curriculum and credits transfer in recognition of studies completed on exchange during candidature at HKU are not included in the calculation of GPA.

¹ Candidates who have been admitted to Year 1 in 2018-19 (and thereafter) and have achieved any one of the following

qualifications are exempted from this requirement, and Core University English is optional. Those who do not take this course should take a 6-credit elective course in lieu, see *Regulation UG6*:

- Level 5 or above in English Language in the HKDSE
- holder of a Bachelor's degree from an English-medium university
- achieved Grade A or above in English Language GCE Advanced Level (AL) / Advanced Subsidiary Level (ASL)
- achieved an overall **IELTS** score of no less than 7 <u>AND</u> with all sub-scores no less than 6.5 on the Reading, Speaking, Listening and Writing Tests
- achieved an overall **TOEFL Internet-based test** score of no less than 94 AND no less than a 24 on the writing, a 20 on the speaking, a 20 on the listening, AND a 19 on the reading sections
- achieved in International Baccalaureate (IB) Grade 4 or above in English A1/ English Language A/ English A: Literature/ English A: Language and Literature (HL); or Grade 5 or above in English B/ English Language B (HL); or Grade 5 or above in English A1/ English Language A/ English A: Literature/ English A: Language and Literature (SL)
- achieved Grade 4 or above on the Advanced Placement (AP) English Language/ English Language and Composition/ English Literature and Composition Test
- achieved a NEW Scholastic Aptitude Test (SAT) score of 35 or above on <u>both</u> the Writing & Language Test <u>and</u> Reading Test (from 2016)
- achieved Grade B or above in H1 General Paper at the Singapore GCE A-level
- achieved Grade A or better in English language at Malaysia SPM examination
- achieved Grade A2 or better in Malaysia UEC-Senior English Language
- attained merit (3 points) or above in each set of credits in **New Zealand NCEA Literacy** (10 credits made up of 5 credits in reading and 5 credits in writing)
- achieved a score of 95% or better in English at All India Senior School Certificate Examination / Higher School Certificate
- achieved a final score of 90% or better in English at Grade 12 Canadian high school curriculum
- achieved Grade B or better in English Language at Sri Lanka Ordinary examination
- achieved a score of 90 or better in English in the **Russian Unified State Exam** (Единый государственный экзамен, ЕГЭ, Yediniy gosudarstvenniy ekzamen, EGE)
- Academic Speaking and Writing test conducted by CAES for students who have not taken any of the above tests
- > When applying to take the Academic Speaking and Writing Test, students should provide evidence to the home Faculty and the CAES1000 Course Coordinator that they were admitted to HKU using qualifications other than those included in the above list.
- > Applicants are required to show the evidence of those other qualifications to the assessor on the day of the Academic Speaking and Writing Test.
- If any applicants failed to provide any evidence that they were admitted to HKU using qualifications other than those included in the above list provided by CAES, the CAES assessor has the rights not to allow the applicant to take the test.
- ² (a) To satisfy the English in the Discipline (ED) requirement, candidates who have passed the ED course for a Major but subsequently change that Major are required to pass the ED course for the new Major, or either of the double Majors finally declared upon graduation irrespective of whether the second Major is offered within or outside of the candidates' home Faculty.
- (b) Candidates declaring double Majors can, if they fail in the ED course for one of the Majors, either (i) re-take and successfully complete that failed ED course, or (ii) successfully complete the ED course for the other Major, irrespective of whether the Major is offered within or outside of the candidates' home Faculty.
- (c) Candidates who undertake studies in double Majors or double degrees are not required to take a second ED course but may be advised by the Faculty to do so.

³ Candidates who have not studied Chinese language during their secondary education may be exempted from this requirement and should take a 6-credit elective course in lieu, see *Regulation UG6*.

Capstone Requirement for

Science Students

SECTION II Capstone Requirement for Science Students

Capstone experience is an integral part of the major programme which focuses on integration and application of knowledge and skills gained in the early years of study. The capstone course carries a minimum of 6 credits and students must complete this for fulfillment of the graduation requirements. Capstone course is normally taken in the senior years (year 3 or 4) of study. The earliest that a student is allowed to take a capstone course is their year 3 study. The capstone courses in each Science major may be different but a range of courses (e.g. research project, seminar, field work, internship and capstone project) is offered to suit individual student's needs and interests. The following courses are currently recognized as capstone courses in the different majors:

BS	c - Major	Recognized Capstone Courses
1.	Biochemistry	1. BIOC3999 Directed studies in biochemistry (6)
	,	2. BIOC4966 Biochemistry internship (6)
		3. BIOC4999 Biochemistry project (12)
2a.	Biological Sciences	1. BIOL3994 Directed studies in biological sciences (6)
		2. BIOL4964 Biological sciences internship (6)
		3. BIOL4994 Biological sciences project (12)
2b.	Biological Sciences (Intensive)	1. BIOL4994 Biological sciences project (12)
	Chemistry	1. CHEM3999 Directed studies in chemistry (6)
	Chemistry (Intensive)	2. CHEM4910 Chemistry literacy and research (6)
	, ,	3. CHEM4911 Capstone experience for chemistry undergraduates: HKUtopia (6)
		4. CHEM4966 Chemistry internship (6)
		5. CHEM4999 Chemistry project (12)
4.	Decision Analytics	1. STAT3799 Directed studies in statistics (6)
	Risk Management	2. STAT4710 Capstone experience for statistics undergraduates (6)
	Statistics	3. STAT4766 Statistics internship (6)
		4. STAT4799 Statistics project (12)
7.	Earth System Science	1. EASC4911 Earth system: contemporary issues (6)
8a.	Ecology & Biodiversity	1. BIOL4991 Ecology & biodiversity project (12)
	Ecology & Biodiversity	1. BIOL3991 Directed studies in ecology & biodiversity (6)
00.	Leology & Bloarversky	2. BIOL4911 Conservation science in practice (6)
		3. BIOL4991 Ecology & biodiversity project (12)
Q	Environmental Science	ENVS3999 Directed studies in environmental science (6)
٦.	Environmental Science	2. ENVS4966 Environmental science internship (6)
		3. ENVS4999 Environmental science project (12)
10	Food & Nutritional Science	BIOL3992 Directed studies in food & nutritional science (6)
10.	1 ood & Tuttitional Science	2. BIOL4922 Food product development and evaluation (6)
		3. BIOL4962 Food & nutritional science internship (6)
		4. BIOL4992 Food & nutritional science project (12)
11.	Geology	1. EASC4955 Integrated field studies (6)
	Geology (Intensive)	
12.	Mathematics	1. MATH3999 Directed studies in mathematics (6)
	Mathematics (Intensive)	2. MATH4910 Senior mathematics seminar (6)
	,	3. MATH4911 Mathematics capstone project (6)
		4. MATH4966 Mathematics internship (6)
		5. MATH4999 Mathematics project (12)
13.	Mathematics / Physics	1. MATH3999 Directed studies in mathematics (6)
	•	2. MATH4910 Senior mathematics seminar (6)
		3. MATH4911 Mathematics capstone project (6)
		4. MATH4966 Mathematics internship (6)
		5. MATH4999 Mathematics project (12)
		6. PHYS3999 Directed studies in physics (6)
		7. PHYS4966 Physics internship (6)
		8. PHYS4999 Physics project (12)
14.	Molecular Biology & Biotechnology	1. BIOL3993 Directed studies in molecular biology & biotechnology (6)
		2. BIOL4963 Molecular biology & biotechnology internship (6)
		3. BIOL4993 Molecular biology & biotechnology project (12)
15.	Astronomy	1. PHYS3999 Directed studies in physics (6)
16.	Physics	2. PHYS4966 Physics internship (6)
	Physics (Intensive)	3. PHYS4999 Physics project (12)

Credit Unit Statement of

BSc Degree Curriculum

SECTION III Credit Unit Statement of the BSc Degree Curriculum

1. General guideline for contact hours requirement in the BSc Degree Curriculum

- (a) A 6-credit course has around 120-180 total study hours, including contact hours, study time, assignment and assessment.
- (b) About 30% of the total study hours are actual contact hours in the form of a class, e.g. lecture hours.
- (c) A 6-credit course has around 36 to 45 lecture hours.
- (d) For lecture-based courses, normally there will be tutorial/discussion sessions.
- (e) For courses employing a non-lecture or lab-based approach, e.g. field camp, IT-based or project-based courses, students are expected to devote about 120-180 hours for a 6-credit course and 240-360 hours for a 12-credit course.

2. Credit Unit Statement of the BSc Degree Curriculum

The BSc degree curriculum consists of six major types of courses based on the learning activities. The majority of courses in the programmes are 6 credits. Examples of the contact hours requirements for the six categories of courses are described as follows.

(a) Lecture-based courses (6 credits)

Contact hours for 6-credit course: 36 hours of lectures and 12 hours of tutorial/discussion These courses are taught predominantly by lectures and tutorials. Assessment is by a combination of examination (0-80%) and continuous assessment (20-100%). Continuous assessment tasks include written assignments (totaling no more than 8,000 words) such as essays and project reports, and oral presentations. Details of the assessment tasks can be found in the description of individual courses.

(b) Lecture with laboratory component courses (6 credits)

Contact hours for 6-credit course: 24 hours of lectures, 24 hours of laboratory and 6 hours of tutorial

These courses are taught by a combination of lectures and laboratory/practical sessions. Assessment is by a combination of examination (0-70%) and continuous assessment (30-100%). Continuous assessment tasks include written assignments (totaling no more than 8,000 words) such as essays, laboratory reports, and project reports, and oral presentations. Details of the assessment tasks can be found in the description of individual courses.

(c) Laboratory and Workshop courses (6 credits)

Contact hours: 48 hours of laboratory or workshop and 12 hours of tutorial

These courses aim at enriching the student's research skills and encourage group work through hands-on activities in which science research is introduced. Students are expected to spend an additional 100 hours on self-study, preparation work for the laboratory, and writing reports. Continuous assessment tasks (100%) include written assignments (totaling no more than 8,000 words) such as laboratory report for each experiment (normally no more than 10 experiments) and essays. Details of the assessment tasks can be found in the description of individual courses.

(d) Project-based courses (6 and 12 credits)

These courses aim at providing students with an opportunity to pursue their own research interest under the supervision of a teacher. The teacher normally meets with the student weekly to discuss project progress. Assessment task is normally through research reports or a dissertation (totaling no more than 10,000 words for a 6-credit course and 20,000 words for a 12-credit course). Oral presentation will form part of the assessment. Details of the assessment tasks can be found in the description of individual courses.

(e) Field camps (6 credits)

Contact hours: at least 72 hours in the field

These courses aim at giving practical experience in a variety of contexts. Fieldwork may be conducted locally or overseas during reading week or summer. Fieldwork courses have a small number of lecture hours but are predominately practical in nature. Assessment tasks (100%) normally include the following outputs (totaling no more than 8,000 words): field

assignments and reports (normally no more than 10 field assignments). Details of the assessment tasks can be found in the description of individual courses.

(f) Internship (6 credits)

Students have to undertake at least 160 hours of internship work Internships aim to offer students the opportunity to gain work experience related to their major of study. The teacher meets with the student regularly to discuss work progress. Students have to undertake at least 160 hours of internship work arranged formally. Assessment tasks (100%) normally include the following outputs: a written report of no more than 2000 words and feedback from the internship supervisor and an oral presentation on students' internship experience. Details of the assessment tasks can be found in the description of individual courses.

3. The types of courses in the 14 Science Majors and 18 Science Minors are as follows:

			Type of Cour	ses		
Majors/Minors	Lecture- based	Lecture with laboratory component	Laboratory & Workshop	Project- based	Field camps	Internship
Actuarial Studies (Minor)	✓	✓	✓	✓		✓
Astronomy (Minor)	✓	✓	✓	✓		✓
Biochemistry (Major & Minor)	✓	✓	✓	✓		✓
Biological Sciences (Intensive Major & Major)	✓	√	✓	✓		✓
Chemistry (Intensive Major, Major & Minor)	✓	✓	✓	✓		✓
Computational & Financial Mathematics (Minor)	✓	✓	✓	✓		✓
Decision Analytics (Major)	✓	✓	✓	✓		✓
Earth Sciences (Minor)	✓	✓	✓	✓	✓	✓
Earth System Science (Major)	✓	✓	✓	✓	✓	✓
Ecology & Biodiversity (Intensive Major, Major & Minor)	√	✓	✓	✓	✓	✓
Environmental Science (Major & Minor)	✓	✓	✓	√	✓	✓
Food & Nutritional Science (Major & Minor)	✓	✓	✓	✓		✓
Geology (Intensive Major & Major)	✓	✓	✓	✓	✓	✓
Marine Biology (Minor)	✓	✓	✓	✓	✓	✓
Mathematics (Intensive Major, Major & Minor)	✓	✓	✓	√		✓
Molecular Biology & Biotechnology (Intensive Major, Major & Minor)	✓	✓	✓	✓		✓
Operations Research & Mathematical Programming (Minor)	✓	✓	✓	✓		✓
Physics (Intensive Major, Major & Minor)	✓	✓	✓	✓		✓
Plant Science (Minor)	✓	✓	✓	✓		✓
Risk Management (Major & Minor)	✓	✓	✓	✓		✓
Science Entrepreneurship (Minor)	✓			✓		✓
Statistics (Major & Minor)	✓	✓	✓	✓		✓

The above different categories of courses follow the unified Credit Unit Statement of the BSc curriculum.

List of BSc Courses and English and

Chinese language courses on offer in 2020-2021 and 2021-2022

SECTION IV List of BSc Courses on offer in 2020/2021 and 2021/2022

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2020 - 2021	Exam. held in 2020 - 2021	Quota	Course Coordinator	Major / Minor (The Major/Minor that this course appears as.)				
				2020 - 2021	2021 - 2022	0=year long 1=1st sem 2=2nd sem S=Summer				Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective	
	omedical Sciences						1			1			T	
BIOC1600	Perspectives in biochemistry	6	Level 3 or above in HKDSE Biology, Chemistry, or Combined Science with Biology or Chemistry component, or equivalent	Y	Y	1	Dec		Dr J Tanner, Biomedical Sciences	Major in Biochemistry (2014,2013)	Major in Biochemistry (2020,2019,2018,2017, 2016,2015); Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)			
BIOC2600	Basic biochemistry	6	Pass in BIOC1600 or BIOL1110 or ENGG1207 or BMED1207; and Not for students who have passed in BIOL2220 or MEDE2301 or BMED2301, or have already enrolled in these courses.	Y	Y	1	Dec	300	Dr. M Kotaka, Biomedical Sciences	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (2020,2019,2018,2017, 2016,2015); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015,2014,2017, 2016,2015)	Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013)			
BIOC3601	Basic metabolism	6	Pass in BIOC2600 or BIOL2220 or MEDE2301 or BMED2301	Y	Y	1	Dec	80	Dr N S Wong, Biomedical Sciences	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)			
BIOC3604	Essential techniques in biochemistry and molecular biology	6	Pass in BIOC2600 or BIOL2220 or BMED2301 or MEDE2301	Y	Y	2	May	70	Dr K M Yao, Biomedical Sciences	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)			
BIOC3605	Sequence bioinformatics	6	Pass in BIOC2600 or BIOL2220 or BBMS2003 or BBMS2007 or MEDE2301 or BMED2301	Y	Y	2	May	80	Dr B C W Wong, Biomedical Sciences		Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)			
BIOC3606	Molecular medicine	6	Pass in BIOC2600 or BIOL2220 or MEDE2301 or BMED2301	Y	Y	2	May	50	Prof D Y Jin, Biomedical Sciences		Major in Biochemistry (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Food & Nutritional Science (2020, 2019); Minor in Biochemistry (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013)			
BIOC3999	Directed studies in biochemistry	6	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in Biochemistry Major including BIOC2600 or BIOL2220	Y	Y	1, 2, S	No exam	36	Prof J D Huang, Biomedical Sciences				Major in Biochemistry (2020,2019,2018,2017 2016,2015,2014,2013)	

[^] Availability of courses in 2021-2022 is subject to change.

			and BIOL3401 This capstone course is for Biochemistry Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.									
BIOC4610	Advanced biochemistry	6	Pass in BIOC3601 or BIOL3401 or BIOL3402 or BIOL3404	Y	Y	1	Dec	50	Dr K M Yao, Biomedical Sciences	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOC4611	Advanced biochemistry II	6	Pass in BIOC3601; and BIOL3404 or CHEM2441; and Pass in BIOC4610, or already enrolled in this course	N	N			50	Prof D Chan, Biomedical Sciences			
BIOC4612	Molecular biology of the gene	6	Pass in BIOC3601 or BIOL3401 or BIOL3402 or BIOL3404 or BBMS2007	Y	Y	2	Мау	50	Prof K S E Cheah, Biomedical Sciences		Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOC4613	Advanced techniques in biochemistry & molecular biology	6	Pass in BIOC3604	Y	Y	1	Dec	70	Prof D Chan, Biomedical Sciences	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOC4966	Biochemistry internship	6	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in Biochemistry Major including BIOC3604. This capstone course is for Biochemistry Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2, S	No exam	20	Prof J D Huang, Biomedical Sciences			Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)
BIOC4999	Biochemistry project	12	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in Biochemistry Major including 4 of the following 5 courses: BIOL3401, BIOC3601, BIOC3604, BIOC4610 and BIOC4613. BIOC4610 and BIOC4613 can be taken concurrently with this course. This capstone course is for Biochemistry Major students only. This capstone course is ONLY opened to students who are in year 3 or above in the Biochemistry Major program.	Y	Y	0	No exam	25	Dr N S Wong, Biomedical Sciences			Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)
BIOL3404	Protein structure and function	6	Pass in BIOC2600 or BIOL2220 or MEDE2301 or BMED2301	Y	Y	2	May	70	Dr C M Qian, Biomedical Sciences		Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (2020,2019,2018,2017, 2016); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in	

											Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
School of Bi	ological Sciences								l		2010,2010,2014,2010)	
BIOL1110	From molecules to cells	6	Students who wish to take this course are expected to have taken HKDSE Biology and/or Chemistry or equivalent. For students without HKDSE Chemistry, they are encouraged to take CHEM1041 concurrently or before. Not for students having taken any level 2 (or above) Biomedical Sciences (BBMS) or Biochemistry (BIOC) or Bachelor of Medicine and Bachelor of Surgery (MBBS) course. Students having taken level 2 BBMS/BIOC/MBBS course should take the replacement course for BIOL11110 in any regular major offered by the School of Biological Sciences.	Y	Y	1, 2	Dec, May	420	Dr G Y W Chan (1st sem); Prof B K C Chow (2nd sem), Biological Sciences	Major in Biochemistry (2014, 2013); Major in Biological Sciences (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Biological Sciences (Intensive) (2020, 2019, 2018, 2017); Major in Ecology & Biodiversity (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Ecology & Biodiversity (Intensive) (2020, 2019, 2018, 2017, 2016, 2015); Major in Food & Nutritional Science (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Molecular Biology & Biotechnology (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Molecular Biology & Biotechnology (1020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Molecular Biology & Biotechnology (1018, 2017, 2016, 2015, 2014, 2013); Major in Molecular Biology & Biotechnology (Intensive) (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2017, 2016, 2015)	Major in Biochemistry (2020,2019,2018,2017, 2016,2015); Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Plant Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Plant Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL1111	Introductory microbiology	6	NIL	N	N			80	, Biological Sciences	Major in Biological Sciences (2014,2013)		
BIOL1201	Introduction to food and nutrition	6	NIL	Y	Y	1	Dec	150	Dr L Zhang, Biological Sciences	Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL1309	Evolutionary diversity	6	NIL	Y	Y	2	May	250	Prof R M K Saunders, Biological Sciences	Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Earth System Science (2014,2013); Major in Ecology & Biodiversity (2020,2019,2018,2017,2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017,2016,2015); Major in Food & Nutritional Science (2016,2015,2014); Minor in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017,2016,2015); Major in Food & Nutritional Science (2016,2015,2014); Minor in Ecology & Biodiversity (2020,2019,2018,2017,2016,2015,2014,2013)	(2013); Major in Molecular Biology &	

											2016,2015,2014,2013)	
BIOL1501	Bioethics	6	NIL	N	N			40	, Biological Sciences			
BIOL1502	The gene	6	NIL Not for students with level 3 or above in HKDSE Biology or Combined Science with Biology component or equivalent.	N	N			50	, Biological Sciences			
BIOL2101	Principles of food chemistry	6	Pass in BIOL1201; and NOT for students who have passed in BIOL3201. The course is only for students admitted in 2017-2018 or thereafter.	Y	Y	1	Dec	100	Dr J C Y Lee, Biological Sciences	Major in Food & Nutritional Science (2020,2019,2018,2017)	Minor in Food & Nutritional Science (2020,2019,2018,2017)	
BIOL2102	Biostatistics	6	Pass in BIOC1600 or BIOL1110 or BIOL2306 or ENVS1301 or ENVS2002 or SCNC1111	Y	Y	2	No exam	169	Dr Juan Gaitan- Espitia, Biological Sciences	Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (1016,2015,2014,2013); Major in Molecular Biology & Biotechnology (1016,2015,2014,2013); Major in Molecular Biology & Biotechnology (1016,2015,2014,2017,2016,2015,2014,2017,2016,2015,2019,2018,2017,2016,2015,2019,2018,2017,2016,2015)	Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL2103	Biological sciences laboratory course	6	Pass in BIOL1110. Not for students having taken any level 3 (or above) Biochemistry (BIOC) course or BBMS2001.	Y	Y	1, 2	Dec, May	210	Dr W Y Lui, Biological Sciences	Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology &	Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Plant Science (2020,2019,2018,2017, 2016,2015,2014,2013)	

										Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015)		
BIOL2220	Principles of biochemistry	6	Pass in BIOL1110; and Not for students who have passed in BIOC2600, or have already enrolled in this course.	Y	Y	1	Dec	100	Dr C S C Lo, Biological Sciences	Major in Biochemistry (2020,2019,2018,2017, 2016,2015); Major in Biological Sciences (2020,2019,2018,2017, 2016,2015); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (1020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (1020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (10202,2019,2018,2017, 2016,2015)	Minor in Biochemistry (2020,2019,2018,2017, 2016,2015); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Plant Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL2306	Ecology and evolution	6	Pass in BIOL1110 or BIOL1309 or ENVS1301 or ENVS1401	>	Y	1	Dec	80	Dr A L Ashton, Biological Sciences	Major in Biological Sciences (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Biological Sciences (Intensive) (2020, 2019, 2018, 2017); Major in Ecology & Biodiversity (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Ecology & Biodiversity (Intensive) (2020, 2019, 2018, 2017, 2016, 2015); Minor in Ecology & Biodiversity (2020, 2019, 2018, 2017, 2016, 2015); Minor in Ecology & Biodiversity (2020, 2019, 2018, 2017, 2016, 2015, 2015, 2014, 2013)	Major in Food & Nutritional Science (2013); Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in	
BIOL2408	Green earth-plants and mankind	6	Pass in BIOL1110	Y	Y	2	May	30	Prof. M L Chye, Biological Sciences		Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015)	
BIOL2409	Biotechnology industry and entrepreneurship	6	Pass in 1110 NOT for students who have passed in BIOL3409.	Y	Y	2	No exam	40	Dr W B L Lim, Biological Sciences	Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015)		
BIOL3101	Animal behaviour	6	Pass in BIOL2306	Y	Y	1	Dec	30	Dr S W Y Sin,	Major in Ecology &	Major in Biological	

BIOL3105	Animal physiology and	6	Pass in BIOL2103 or BIOL2220 or	Y	Y	2	May	60	Biological Sciences Prof A O L Wong,	Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015)	Sciences (Intensive) (2020,2019,2018,2017); Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3105	Animal physiology and environmental adaptation	6	BIOC2600 or MEDE2301	Y	Y	2	May	60	Biological Sciences		Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017)	
BIOL3107	Plant physiology	6	Pass in BIOL2103 NOT for students who have passed in ENVS3202	N	N			30	TBC, Biological Sciences		Major in Biological Sciences (2019,2018,2017,2016, 2015,2014,2013); Major in Biological Sciences (Intensive) (2019,2018,2017); Major in Molecular Biology & Biotechnology (Intensive) (2019,2018,2017,2016, 2015); Minor in Plant Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3108	Microbial physiology	6	Pass in BIOC2600 or BIOL2103 or BIOC3604	N	N		1	50	Dr A Yan, Biological Sciences		Major in Biological Sciences (2015,2014,2013)	
BIOL3109	Environmental microbiology	6	Pass in BIOL2103	Y	Y	2	No exam	40	Dr S Crowe, Earth Sciences		Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Ecology & Biodiversity (2016,2015,2014,2013); Major in Environmental Science (2020,2019,2018,2017, 2016,2015)	
BIOL3110	Environmental toxicology	6	Pass in BIOL2103 or CHEM3141 or ENVS3042	N	Y			60	TBC, Biological Sciences		Major in Biological Sciences (2015,2014,2013); Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3201	Food chemistry	6	Pass in BIOC2600 or BIOL2103 or BIOL2220 or MEDE2301; and NOT for students who have passed in BIOL2101. This course is only for students	Y	Y	1	Dec	60	Dr J C Y Lee, Biological Sciences	Major in Food & Nutritional Science (2016,2015,2014,2013)	Minor in Food & Nutritional Science (2016,2015,2014,2013)	

			admitted in 2016-2017 or before.	1		1		I					1
BIOL3202	Nutritional biochemistry	6	Pass in BIOC2600 or BIOL2220 or MEDE2301	Y	Y	1	Dec	90	Dr J C Y Louie, Biological Sciences	Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
BIOL3203	Food microbiology	6	Pass in BIOC2600 or BIOL2220 or MEDE2301	Y	Y	2	No exam	120	Dr H S El-Nezami, Biological Sciences	Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Biological Sciences (2020,2019,2018,2017, 2016); Major in Biological Sciences (Intensive) (2020,2019,2018,2017) ; Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
BIOL3204	Nutrition and the life cycle	6	Pass in BIOL2220 or BIOC2600 or BIOL3202	Y	Y	2	No exam	70	Dr J C Y Lee, Biological Sciences		Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
BIOL3205	Human physiology	6	Pass in BIOC2600 or BIOL2103 or BIOL2220 or MEDE2301	Y	Y	1	Dec	135	Dr W Y Lui, Biological Sciences		Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
BIOL3206	Clinical nutrition	6	Pass in BIOL3202 or BIOL3203 or BIOL3204 or BIOL3205	N	N			70	Dr J M F Wan, Biological Sciences		Major in Food & Nutritional Science (2018,2017,2016,2015, 2014,2013); Minor in Food & Nutritional Science (2018,2017,2016,2015, 2014,2013)		
BIOL3207	Principles of toxicology	6	Pass in BIOC2600 or BIOL2220 or BIOL3205 or MEDE2301	Y	Y	2	No exam	80	Dr H S El-Nezami, Biological Sciences		Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science		

											(2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3208	Food safety and quality management	6	Pass in BIOL3201 or BIOL3203	N	N			45	Dr O Habimana, Biological Sciences		Major in Food & Nutritional Science (2016,2015,2014,2013) ; Minor in Food & Nutritional Science (2016,2015,2014,2013)	
BIOL3209	Food and nutrient analysis	6	Pass in BIOL2101 or BIOL3201 Not for students who have passed in CHEM3242	Y	Y	1	Dec	80	Dr J C Y Lee, Biological Sciences	Major in Food & Nutritional Science (2018,2017)	Major in Food & Nutritional Science (2020,2019,2016,2015, 2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3210	Grain production and utilization	6	Pass in any level 2 BIOL course	Z	N			40	Prof H Corke, Biological Sciences		Major in Food & Nutritional Science (2016, 2015, 2014, 2013) ; Minor in Food & Nutritional Science (2016, 2015, 2014, 2013) ; Minor in Plant Science (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013)	
BIOL3211	Nutrigenomics	6	Pass in BIOC2600 or BIOL2220 or MEDE2301	Y	Y	1	Dec	40	Dr K C Tan-Un, Biological Sciences		Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3215	Principles of dietary assessment	6	Pass in BIOL2102	N	N			30	Dr J C Y Louie, Biological Sciences		Major in Food & Nutritional Science (2018,2017,2016,2015, 2014,2013)	
BIOL3216	Food waste management	6	Pass in BIOL2101 or BIOL3201	Y	Y	2	May	30	Dr O Habimana, Biological Sciences		Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3217	Food, environment and health	6	Pass in BIOL 2101 or ENVS2001 or ENVS2002 or BIOL3201	Y	Y	2	No exam	50	Dr T. Sobko, Biological Sciences		Major in Environmental Science (2020,2019,2018,2017, 2016,2015); Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3218	Food hygiene and quality control	6	Pass in BIOL2101 or BIOL3201 or BIOL3203 Not for students who have passed in BIOL3208	Y	Y	1	Dec	30	Dr O Habimana, Biological Sciences		Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science	

											(2020,2019,2018,2017, 2016,2015,2014,2013)
BIOL3301	Marine biology	6	Pass in BIOL2306 or ENVS2002	Y	Y	1	Dec	40	Dr M Yasuhara, Biological Sciences	Major in Ecology & Biodiversity (2020,2019,2018,2017); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017,2016,2015); Minor in Marine Biology (2020,2019,2018,2017,2016,2015,2014,2013)	Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017) ; Major in Ecology & Biodiversity (2016,2015,2014,2013) ; Minor in Ecology & Biodiversity (2016,2015,2014,2013) ; Oliopic in Ecology & Coliopic in Eco
BIOL3302	Systematics and phylogenetics	6	Pass in BIOL1309; and Any level 2 BIOL course	Y	Y	1	Dec	60	Prof R M K Saunders, Biological Sciences	Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017) ; Minor in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013)
BIOL3303	Conservation biology	6	Pass in BIOL2306	Y	Y	2	May	100	Dr T C Bonebrake, Biological Sciences	Major in Ecology & Biodiversity (2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Ecology & Biodiversity (2020,2019,2018,2017); Major in Ecology & Biodiversity (2020,2019,2018,2017); Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Marine Biology (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Marine Biology (2020,2019,2018,2017, 2016,2015,2014,2013)
BIOL3305	Tropical and temperate marine ecology field course	6	Pass in "C" or above in BIOL2306 or BIOL3301 or BIOL3303 or ENVS2001	N	Y			22	Dr B Russell, Biological Sciences		Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Marine Biology (2020,2019,2018,2017, 2016,2015,2015,2017,
BIOL3313	Freshwater ecology	6	Pass in BIOL2102 and BIOL2306	N	N			30	TBC, Biological Sciences		Major in Ecology & Biodiversity

											(2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3314	Plant structure and evolution	6	Pass in BIOL1309; and Any level 2 BIOL course	z	Y			30	Prof R M K Saunders, Biological Sciences		Major in Biological Sciences (2020,2019,2018,2017, 2016); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015); Minor in Plant Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Plant Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3318	Experimental intertidal ecology	6	Pass in BIOL2102 or BIOL3301	Y	N	2	May	20	Prof G A Williams, Biological Sciences		Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Marine Biology (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3319	Tropical terrestrial ecology	6	Pass in BIOL1309 and BIOL2306	Y	Y	2	May	30	Dr B Guenard, Biological Sciences	Major in Ecology & Biodiversity (2020,2019,2018,2017); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Biological Sciences (2020,2019); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Ecology & Biodiversity (2016,2015,2014,2013); Minor in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3320	The biology of marine mammals	6	Pass in BIOL2306	N	N			30	, Biological Sciences		Major in Ecology & Biodiversity (2016,2015,2014,2013); Minor in Ecology & Biodiversity (2016,2015,2014,2013); Minor in Marine Biology (2016,2015,2014,2013)	

BIOL3322	Marine invertebrate zoology	6	Pass in BIOL2306	N	Y			30	Dr S Cannicci, Biological Sciences		Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Marine Biology (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3328	Nearshore marine and estuarine ecology	6	Pass in BIOL2306 or BIOL3301	Z	Y	-1		10	Prof. G.A. Williams, Biological Sciences		Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Marine Biology (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3401	Molecular biology	6	Pass in BIOC2600 or BIOL2103 or BIOL2220 or MEDE2301 or BMED2301	Y	Y	1	Dec	130	Dr K W Y Yuen, Biological Sciences	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Molecular Biology & Biotechnology & Biotechnology (2020,2019,2018,2017, 2016,2019,2018,2017, 2016,2019,2018,2017, 2016,2015,2014,2013)	Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3402	Cell biology and cell technology	6	Pass in BIOC2600 or BIOL2103 or BIOL2220 or MEDE2301	Y	Y	1	Dec	120	Prof A S T Wong, Biological Sciences	Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3403	Immunology	6	Pass in BIOC2600 or BIOL2103 or BIOL2220 or MEDE2301 or BMED2301	Y	Y	2	May	90	Dr Chaogu Zheng, Biological Sciences		Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive)	

										(2020,2019,2018,2017) ; Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013)
BIOL3405	Molecular microbiology	6	Pass in BIOL2103	N	N			30	, Biological Sciences	Major in Molecular Biology & Biotechnology (2015,2014,2013)
BIOL3406	Reproduction and reproductive biotechnology	6	Pass in BIOL2103 or BIOL2220 or BIOC2600 or MEDE2301	Y	Y	1	Dec	50	Prof A O L Wong, Biological Sciences	Major in Biological Sciences (2020,2019,2018,2017, 2016); Major in Biological Sciences (Intensive) (2020,2019,2018,2017) ; Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015)
BIOL3408	Genetics	6	Pass in BIOL1110; and BIOL2102 or BIOL2103	Y	Y	1	Dec	50	Dr G Y W Chan, Biological Sciences	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017) ; Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016); Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Plant Science

											(2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3409	Business aspects of biotechnology	6	Pass in any level 3 BIOL or BIOC or BBMS course; NOT for students who have passed in BIOL2409. This course is only for students admitted in 2017-2018 or before.	N	N			40	Dr W B L Lim, Biological Sciences		Major in Biological Sciences (2015,2014,2013); Major in Molecular Biology & Biotechnology (2017,2016,2015,2014, 2013); Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3419	Insect ecology: the little things that run the world	6	Pass in BIOL1309 and BIOL2306	Y	N	1	Dec	25	Dr B Guenard, Biological Sciences		Major in Biological Sciences (2018,2017,2016); Major in Ecology & Biodiversity (2020,2019,2018,2017,2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017,2016,2015); Minor in Ecology & Biodiversity (2020,2019,2018,2017,2016,2015,2014,2013)	
BIOL3501	Evolution	6	Pass in BIOL2306	N	N			50	Dr M Sun, Biological Sciences		Major in Biological Sciences (2018,2017,2016)	
BIOL3502	Conservation genetics	6	Pass in BIOL2306 or BIOL3303 or BIOL3408	N	N			50	Dr M Sun, Biological Sciences			
BIOL3503	Endocrinology: human physiology II	6	Pass in BIOL2103	Y	Y	2	May	60	Dr C B Chan, Biological Sciences		Major in Biological Sciences (2020,2019,2018,2017, 2016); Major in Biological Sciences (Intensive) (2020,2019,2018,2017)	
BIOL3505	Oyster aquaculture and restoration	6	Pass in BIOL2103 or BIOL2306 or BIOL3301 or BIOL3303	N	N			20	Dr T Vengatesen, Biological Sciences		Major in Ecology & Biodiversity (2016,2015,2014,2013)	
BIOL3506	Evolutionary biology	6	Pass in BIOL2306 Not for students who have passed in BIOL3501	Y	Y	1	Dec	50	J D Gaitan-Espitia, Biological Sciences		Major in Biological Sciences (2020,2019,2018,2017, 2016); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015); Minor in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015)	
BIOL3508	Microbial physiology and biotechnology	6	Pass in BIOL2103 or BIOL2220 or BIOC2600 or BIOC3604; Not for students who have passed in	Y	Y	1	Dec	60	Dr A Yan, Biological Sciences	Biology &	Major in Biological Sciences (2020,2019,2018,2017,	

			BIOL3108; and Not for students who have passed in BIOL4402.							(2017,2016,2015,2014, 2013)	2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Molecular Biology & Biotechnology (2020,2019,2018); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2019,2018,2017, 2010,2019,2018,2017, 2016,2019,2018,2017,	
BIOL3606	Diet and disease	6	Pass in BIOL2220 or BIOC2600 or BIOL3202 or BIOL3203 or BIOL3204 or BIOL3205 Not for students who have passed in BIOL3206	Y	Y	2	No exam	70	Dr J C Y Lee, Biological Sciences		Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3608	Food commodities	6	Pass in BIOL3201 or (BIOL2101 and any level 3 BIOL course); and Not for students who have passed in BIOL3210; Not for students who have passed in BIOL4207; and Not for students who have passed in BIOL4208.	Y	Y	2	May	30	Prof N P Shah, Biological Sciences		Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL3951	Ecology & biodiversity field course	6	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Ecology & Biodiversity Major. This capstone course is for Ecology & Biodiversity Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	N	N			20	Dr L Karczmarski, Biological Sciences			Major in Ecology & Biodiversity (2015,2014,2013)
BIOL3991	Directed studies in ecology & biodiversity	6	Pass in at least 24 credits of advanced level disciplinary core / elective courses in the Ecology & Biodiversity (Intensive) Major / Ecology & Biodiversity (Intensive) Major. This capstone course is for Ecology & Biodiversity Major / Ecology & Biodiversity (Intensive) Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2	No exam		Dr S W Y Sin, Biological Sciences			Major in Ecology & Biodiversity (2018,2017,2016,2015, 2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015)
BIOL3992	Directed studies in food & nutritional science	6	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Food & Nutritional Science Major. This capstone course is for Food & Nutritional Science Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2, S	No exam		Dr T Sobko (1st and 2nd Semester), Dr J C Y Louie (Summer), Biological Sciences			Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)

BIOL3993	Directed studies in Molecular biology & biotechnology	6	Pass in at least 24 credits of advanced level disciplinary core / elective courses in the Molecular Biology & Biotechnology Major. This capstone course is for Molecular Biology & Biotechnology Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2	No exam		Dr A Yan, Biological Sciences		Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013)
BIOL3994	Directed studies in biological sciences	6	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Biological Sciences Major. This capstone course is for Biological Sciences Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2	No exam		Dr S Cannicci, Biological Sciences		Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)
BIOL4201	Public health nutrition	6	Pass in BIOL3201 or BIOL3202	Y	Y	2	No exam	90	Dr J C Y Louie, Biological Sciences	Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL4202	Nutrition and sports performance	6	Pass in BIOL3202	Y	Y	1	No exam	20	Dr T Sobko, Biological Sciences	Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL4204	Diet, brain function and behavior	6	Pass in BIOL3204, or already enrolled in this course	N	N			30	Dr E T S Li, Biological Sciences	Major in Food & Nutritional Science (2016,2015,2014,2013); Minor in Food & Nutritional Science (2019,2018,2017,2016, 2015,2014,2013)	
BIOL4205	Food technology	6	Pass in BIOL3201 or BIOL3209	Y	Y	2	May	30	Prof N P Shah, Biological Sciences	Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL4207	Meat and dairy sciences	6	Pass in BIOL3201	N	N			50	Prof N P Shah, Biological Sciences	Major in Food & Nutritional Science (2016,2015,2014,2013) ; Minor in Food & Nutritional Science (2016,2015,2014,2013)	
BIOL4208	Meat, dairy and grain sciences	6	Pass in BIOL3201 or (BIOL2101 and any level 3 BIOL course); and Not for students who have passed in BIOL3210; and Not for students who have passed in BIOL4207	N	N			15	Prof N P Shah, Biological Sciences	Major in Food & Nutritional Science (2018,2017,2016,2015, 2014,2013); Minor in Food & Nutritional Science (2018,2017,2016,2015, 2014,2013)	

BIOL4209	Functional foods	6	Pass in BIOL3201 or BIOL3202	Y	Y	1	Dec	40	Dr M F Wang, Biological Sciences	Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Plant Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL4210	Food product development	6	Pass in BIOL3203 or BIOL4205	Z	N			40	Dr M F Wang, Biological Sciences	Major in Food & Nutritional Science (2015,2014,2013); Minor in Food & Nutritional Science (2016,2015,2014,2013)	
BIOL4301	Fish and fisheries	6	Pass in BIOL3301 or BIOL3303	N	N			40	TBC, Biological Sciences	Major in Biological Sciences (2015,2014,2013); Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Marine Biology (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Marine Biology (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL4302	Environmental impact assessment	6	Pass in (BIOL2103 or BIOL2306); and (ENVS3004 or any BIOL3XXX course)	Y	Y	2	No exam	30	Dr J Wu, Biological Sciences	Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015,2014,2013); Mijor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Mijor in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Mijor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Mijor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL4303	Animal behaviour	6	Pass in BIOL2306; and Pass in one of the following courses: BIOL3301, BIOL3313, BIOL3319, BIOL3320 or BIOL3419 Not for students who have passed in BIOL3101	N	N			30	Dr L Karczmarski, Biological Sciences	Major in Ecology & Biodiversity (2015,2014,2013); Minor in Ecology & Biodiversity (2015,2014,2013)	
BIOL4304	Ecosystem functioning and services	6	Pass in one of the following courses: BIOL3301 or BIOL3303 or BIOL3313 or BIOL3319 or ENVS3019 or ENVS3004	N	Y			30	Dr B D Russell, Biological Sciences	Major in Ecology & Biodiversity (2020,2019,2018,2017,	

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			or ENVS3020								2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015)		
BIOL4401	Medical microbiology and applied immunology	6	Pass in BIOL3401	Y	Y	2	May	40	Dr W Y Lui, Biological Sciences		Major in Biological Sciences (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Biological Sciences (Intensive) (2020, 2019, 2018, 2017); Major in Molecular Biology & Biotechnology (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Molecular Biology & Biotechnology (Intensive) (2020, 2019, 2018, 2017, 2016, 2015); Minor in Molecular Biology & Biotechnology (2020, 2019, 2018, 2017, 2016, 2019, 2018, 2017, 2010, 2019, 2018, 2017, 2010, 2019, 2018, 2017, 2016, 2015, 2014, 2013)		
BIOL4402	Microbial biotechnology	6	Pass in BIOL3401	N	N			30	, Biological Sciences	Major in Molecular Biology & Biotechnology (2015,2014,2013)	Minor in Molecular Biology & Biotechnology (2015,2014,2013)		
BIOL4409	General virology	6	Pass in BIOL3401 or BIOL3403	Y	Z	1	TBC	30	Dr W B L Lim, Biological Sciences		Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015)		
BIOL4411	Plant and food biotechnology	6	Pass in BIOL3211 or BIOL3401	Y	Y	1	Dec	60	Prof M L Chye, Biological Sciences	Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Biological Sciences (2020,2019,2018,2017, 2016); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Molecular Biology & Minor in Molecular Biolo		
BIOL4415	Healthcare biotechnology	6	Pass in BIOL3401	Y	Y	2	May	70	Prof A S T Wong,	Major in Molecular	Minor in Molecular		

									Biological Sciences	Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015)	Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013)	
BIOL4416	Stem cells and regenerative biology	6	Pass in BIOC3601 or BIOC3604 or BIOL3211 or BIOL3401 or BIOL3402 or BIOL3403 or BIOL3404 or BIOL3408	Y	N	2	May	40	Dr K W Y Yuen, Biological Sciences		Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015); Oliopical Properties of the Company of the Compan	
BIOL4417	'Omics' and systems biology	6	Pass in BIOC3601 or BIOC3604 or BIOL3211 or BIOL3401 or BIOL3402 or BIOL3403 or BIOL3404 or BIOL3408	Y	Y	2	May	40	Dr J W Zhang, Biological Sciences	Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Biochemistry (2020,2019,2018,2017,2016,2015,2014,2013); Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017,2016,2015,2014,2013)	
BIOL4451	Cetacean behaviour, ecology and conservation: field research experience	6	Pass in at least one of the following courses: BIOL3101, BIOL3301, BIOL3313 or BIOL3320. This experiential field course is primarily for Ecology & Biodiversity Major students. The earliest that a student is allowed to take this experiential course is their year 3 study; and because it is conducted in early June, this course is best suited for year 3 students.	N	N			12	, Biological Sciences		Major in Ecology & Biodiversity (2016,2015,2014,2013)	
BIOL4501	Molecular phylogenetics and evolution	6	Pass in BIOL3401 or BIOL3408	Z	Ν			25	TBC, Biological Sciences			
BIOL4505	Oyster aquaculture	6	Pass in BIOL3109 or BIOL3203 or BIOL3301 or BIOL3303 or ENVS3004 or ENVS3313; and Pass in at least 24 credits of advanced level disciplinary core/elective courses in the Ecology and Biodiversity	Y	N	2	No exam	20	Dr T Vengatesen, Biological Sciences		Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive)	

			Major or Environmental Science Major or Biological Science Major. Not for students who have passed in BIOL3505								2020,2019,2018,2017, 016,2015)	
BIOL4861	Ecology & biodiversity internship	6	Pass in at least 24 credits of advanced level disciplinary core / elective courses in the Ecology and Biodiversity Major. This course is for Ecology & Biodiversity Major students only. The earliest that a student is allowed to take this course is their Year 3.	Y	Y	1, 2, S	No exam		Dr T Vengatesen, Biological Sciences	B (2	Aajor in Ecology & Biodiversity 2020,2019,2018,2017, 0016,2015,2014,2013)	
BIOL4911	Conservation science in practice	6	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Ecology & Biodiversity Major / Ecology & Biodiversity Major / Ecology & Biodiversity (Intensive) Major including BIOL3303. This capstone course is for Ecology & Biodiversity Major / Ecology & Biodiversity Major / Ecology & Biodiversity (Intensive) Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	N	N			9	TBC, Biological Sciences			Major in Ecology & Biodiversity (2018,2017,2016,2015, 2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015)
BIOL4912	Sensory evaluation of food	6	Pass in BIOL3201; and Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Food & Nutrional Science Major. This capstone course is for Food & Nutrional Science Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	N	N			15	Dr J C Y Lee, Biological Sciences			Major in Food & Nutritional Science (2016,2015,2014,2013)
BIOL4913	Advanced practicum on food and nutrient analysis	6	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) included BIOL3207 and / or BIOL3209 in the Food & Nutrional Science Major. This capstone course is for Food & Nutrional Science Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	N	Z			8	Dr J C Y Lee, Biological Sciences			Major in Food & Nutritional Science (2018,2017,2016,2015, 2014,2013)
BIOL4921	Animal behaviour and behavioural ecology: field course	6	Pass in BIOL3101; and Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Ecology & Biodiversity Major. This capstone course is for Ecology & Biodiversity Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	N	Z			15	, Biological Sciences			Major in Ecology & Biodiversity (2016,2015,2014,2013)
BIOL4922	Food product development and evaluation	6	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) included BIOL3203 and / or BIOL4205 in the Food & Nutritional Science Major. This capstone course is for Food &	Y	Y	1	Dec	20	Dr M F Wang, Biological Sciences			Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)

			Nutritional Science Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study. Not for students who have passed in BIOL4210 Food product development.								
BIOL4962	Food & nutritional science internship	6	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Food & Nutritional Science Major. This capstone course is for Food & Nutritional Science Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2, S	No exam	 Dr J C Y Lee, Biological Sciences			Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)
BIOL4963	Molecular biology & biotechnology internship	6	Pass in at least 24 credits of advanced level disciplinary core / elective courses in the Molecular Biology & Biotechnology Major. This capstone course is for Molecular Biology & Biotechnology Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2, S	No exam	 Dr A Yan, Biological Sciences			Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013)
BIOL4964	Biological sciences internship	6	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Biological Sciences Major. This captsone course is for Biological Sciences Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2, S	No exam	 Dr S Cannicci (Sem 1 & 2); Dr Y W Chan (Summer), Biological Sciences			Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)
BIOL4991	Ecology & biodiversity project	12	Pass in at least 24 credits of advanced level disciplinary core / elective courses in the Ecology & Biodiversity Major / Ecology & Biodiversity Major (Intensive); and This capstone course is for Ecology & Biodiversity Major / Ecology & Biodiversity Major / Ecology & Biodiversity Major / Intensive) students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	0	No exam	 Dr S W Y Sin, Biological Sciences		Major in Ecology & Biodiversity (2020,2019); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Ecology & Biodiversity (2018,2017,2016,2015, 2014,2013)
BIOL4992	Food & nutritional science project	12	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Food & Nutritional Science Major; and Cumulative GPA of 3.0 or above. This capstone course is for Food & Nutritional Science Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	0	No exam	 Dr T Sobko, Biological Sciences			Major in Food & Nutritional Science (2020,2019,2018,2017, 2016,2015,2014,2013)
BIOL4993	Molecular biology & biotechnology project	12	Pass in at least 24 credits of advanced level disciplinary core / elective courses in the Molecular Biology & Biotechnology Major / Molecular Biology & Biotechnology Major (Intensive); and Cumulative GPA of 3.0 or above.	Y	Y	0	No exam	 Dr A Yan, Biological Sciences		Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013)

			This capstone course is for Molecular Biology & Biotechnology Major / Molecular Biology & Biotechnology Major (Intensive) students only. The earliest that a student is allowed to take this capstone course is their year 3 study.										
BIOL4994	Biological sciences project	12	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Biological Sciences Major; and Cumulative GPA of 3.0 or above. This capstone course is for Biological Sciences Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	0	No exam		Dr S Cannicci, Biological Sciences			Major in Biological Sciences (Intensive) (2020,2019,2018,2017)	Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)
ENVS1301	Environmental life science	6	NIL	Y	Y	2	May	60	Dr T Vengatesen, Biological Sciences		Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Marine Biology (2020,2019,2018,2017, 2016,2015,2014,2013)		
ENVS2001	Methods in environmental science	6	Pass in BIOL1309 or EASC1401 or ENVS1301 or ENVS1401	Y	Y	1	No exam	42	Dr D M Baker, Biological Sciences	Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
ENVS2002	Environmental data analysis	6	Pass in BIOL1309 or EASC1401 or ENVS1301 or ENVS1401	Y	Y	2	May	65	Dr T C Bonebrake, Biological Sciences	Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
ENVS3004	Environment, society and economics	6	Pass in one of the following courses: CHEM2041, EASC2404, ENVS2001 or ENVS2002	Y	Y	1	Dec		Dr C Dingle, Biological Sciences	Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)			
ENVS3019	Urban ecology	6	Pass in BIOL2306 or ENVS2001 or ENVS2002	N	Y			75	Dr T C Bonebrake, Biological Sciences		Major in Ecology & Biodiversity (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental		

											ce ,2019,2018,2017, 2015,2014,2013)	
ENVS3020	Global change ecology	6	Pass in BIOL2306 or ENVS2001 or ENVS2002	Y	N	2	No exam	65	Dr C Dingle, Biological Sciences	Biodiv (2020, 2016,2 Majori Biodiv (2020, 2016,2 Enviro (2020, 2016,2 Minor i Scienc (2020,	,2019,2018,2017, 2015,2014,2013); in Ecology & tersity (Intensive) ,2019,2018,2017, 2015); Major in nmental Science ,2019,2018,2017, 2015,2014,2013); in Environmental	
ENV\$3022	Environmental science field course	6	Pass in ENVS2001 or Either pass in ENVS2002 or concurrently enrolled in ENVS2002	N	Y			10	Dr M Yasuhara, Biological Sciences	Scienc	,2019,2018,2017,	
ENVS3028	Coastal Sustainability	6	Pass in BIOL2306 or BIOL3301 or BIOL3305 or BIOL3318 or ENVS2001 or ENVS2002 or EASC3020	N	Y			8	Dr T Vengatesen, Biological Sciences	Science	,2019,2018,2017,	
ENVS3202	Plant physiology and climate change	6	Pass in BIOL2306 or ENVS2001 or ENVS2002 or EASC2404. Priority will be given to students majoring in Environmental Science, Biological Science, and Earth System Science.	Y	Y	1	Dec	50	Dr J Wu, Biological Sciences	Scienc (2020, 2016); Biologi (Intens (2020, ; Major Enviro (2020, 2016,2 Molect Biotect (Intens (2020, 2016);	"2019,2018,2017, ; Major in icical Sciences sive) "2019,2018,2017) r in onmental Science "2019,2018,2017, 2015); Major in ular Biology & chnology sive) "2019,2018,2017, ; Minor in onmental Science	
ENVS3401	Understanding tropical ecosystems in a changing world	6	Pass in ENVS2001 or ENVS2002 or BIOL2306	N	Y			20	Dr A L Ashton, Biological Sciences	Scienc (2020, 2016,2	,2019,2018,2017, 2015); Minor in onmental Science	
ENVS3402	Qualitative data, social science methods and decision-making in environmental science	6	Pass in ENVS2002	Y	Y	2	May	30	Dr Hannah Mumby, Biological Sciences	Scienc	,2019,2018,2017,	
ENVS4110	Environmental remediation	6	Pass in BIOL3109 or BIOL3110 or BIOL3401 or ENVS3042	N	Y			30	TBC, Biological Sciences	Scienc (2020, 2016,2 Major i Biolog Bioteci (2020, 2016,2	,2019,2018,2017, 2015,2014,2013); in Molecular ly & chnology ,2019,2018,2017, 2015,2014,2013); in Molecular	

											Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Molecular Biology & Biotechnology (2020,2019,2018,2017, 2016,2015,2014,2013)	
Centre for Ap	pplied English Studies											
CAES1000	Core University English	6	NIL	Υ	Υ	1, 2	No exam		Dr P Wong, English			
CAES9820	Academic English for science students	6	NIL	Υ	Υ	1, 2	No exam		Mr S D Boynton, English			
CAES9821	Professional and technical communication for mathematical sciences	6	NIL	Υ	Υ	1, 2	No exam		Mr S D Boynton, English			
Department of	of Chemistry					•	•					
CHEM1041	Foundations of chemistry	6	Level 3 or above in HKDSE Combined Science with Chemistry component or Integrated Science, or equivalent. Students without such background but keen on taking this foundation chemistry course may approach the course coordinator for consideration. Not for students with Level 3 or above in HKDSE Chemistry or having taken any level 1 Chemistry course or above or any equivalent Chemistry course.	Y	Y	1	Dec	50	Dr A P L Tong, Chemistry		Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015)	
CHEM1042	General chemistry I	6	Level 3 or above in HKDSE Chemistry or equivalent or a pass in CHEM1041. Not for students having taken any level 1 Chemistry course (except for CHEM1041) or above or any equivalent Chemistry course.	Y	Y	1, 2	Dec, May	450	Dr A P L Tong, Chemistry	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Major in Environmental Science (2020,2019,2018); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Major in Environmental Science (2017,2016,2015,2014, 2013); Major in Food & Nutritional Science (2020,2019); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM1043	General chemistry II	6	Pass in CHEM1042; and Not for students in 2014-15 cohort or before having taken CHEM2541.	Y	Y	1, 2	Dec, May	280	Dr A P L Tong, Chemistry	Major in Biochemistry (2020,2019,2018,2017, 2016,2015); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Chemistry (2020,2019,2018,2017, 2016,2015); Major in	Major in Biochemistry (2014,2013)	

										Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015)		
CHEM1044	Mathematics in chemistry	6	Pass in CHEM1042 or already enrolled in this course; and Level 2 or above in Module 1 or Module 2 of HKDSE Mathematics or equivalent, or Pass in MATH1011 or SCNC1111	Y	~	2	May	80	Dr A M Y Yuen, Chemistry		Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	
CHEM2041	Principles of chemistry	6	Pass in CHEM1042; and Not for students who have passed in CHEM2341, or have already enrolled in this course; and Not for students who have passed in CHEM2441, or have already enrolled in this course; and Not for students who have passed in CHEM2541, or have already enrolled in this course; and Not for CHEM2541, or have already enrolled in this course; and Not for Chemistry major students.	Z	Z			140	Dr I K Chu, Chemistry		Major in Environmental Science (2017, 2016, 2015, 2014, 2013); Minor in Chemistry (2016, 2015, 2014, 2013); Minor in Environmental Science (2017, 2016, 2015, 2014, 2013)	
CHEM2241	Analytical chemistry I	6	Pass in CHEM1042 (for students admitted in 2014-15 or before); Pass in CHEM1042; and Pass in CHEM1043, or already enrolled in this course (for students admitted in 2015-16 or thereafter)	\	~	1, 2	Dec, May	120	Dr E C M Tse (1st sem); Dr I K Chu (2nd sem), Chemistry	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Environmental Science (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Minor in Chemistry (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Minor in Environmental Science (2017, 2016, 2015, 2014, 2013)	
CHEM2341	Inorganic chemistry I	6	Pass in CHEM1042; and NOT for students who have passed in CHEM2041, or already enrolled in this course (for students admitted in 2014-15 or before); Pass in CHEM1042; and Pass in CHEM1043, or already enrolled in this course; and NOT for students who have passed in CHEM2041, or already enrolled in this course (for students admitted in 2015-16 or thereafter)	Y	>	1, 2	Dec, May	120	Prof V W W Yam (1st sem); Dr H Y Au Yeung (2nd sem), Chemistry	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM2441	Organic chemistry I	6	Pass in CHEM1042; and NOT for students who have passed in CHEM2041, or already enrolled in this course (for students admitted in 2014-15 or before); Pass in CHEM1042; and Pass in CHEM1043, or already enrolled in this course; and NOT for students who have passed CHEM2041, or already enrolled in this course (for students admitted in 2015-16 or thereafter)	Y	Y	1, 2	Dec, May	200	Dr X Y Li (1st sem); Prof P Chiu (2nd sem), Chemistry	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM2442	Fundamentals of organic chemistry	6	Pass in CHEM1042; and Not for students who have passed CHEM2441, or have already enrolled in this course.	Y	Y	1	Dec	100	Dr P H Toy, Chemistry		Major in Environmental Science (2017,2016,2015,2014, 2013); Major in Food &	

											Nutritional Science (2020,2019); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental Science (2017,2016,2015,2014, 2013)	
CHEM2443	Fundamentals of organic chemistry for pharmacy students	6	Pass in CHEM1042; and Not for students who have passed CHEM2442, or already enrolled in this course. (This course is for BPharm students only)	N	N			60	Dr P H Toy, Chemistry			
CHEM2541	Introductory physical chemistry	6	Pass in CHEM1042; and NOT for students who have passed CHEM2041, or already enrolled in this course (for students admitted in 2014-15 or before); Pass in CHEM1042 and CHEM1043; and NOT for students who have passed CHEM2041, or already enrolled in this course (for students admitted in 2015-16 or thereafter)	Y	Y	2	May	100	Dr J Y Tang (2nd sem), Chemistry	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Biochemistry (2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3141	Environmental chemistry	6	Pass in CHEM2041 or CHEM2341 or CHEM2441 or CHEM2442 or CHEM2541	Y	Y	2	May	50	Dr Y X Li, Chemistry		Major in Chemistry (2014,2013); Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3142	Chemical process industries and analysis	6	Pass in CHEM2241 or CHEM2341 or CHEM2441 or CHEM2442 or CHEM2541	Y	Y	2	May	60	Prof G K Y Chan, Chemistry		Major in Chemistry (2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3143	Introduction to materials chemistry	6	Pass in CHEM2441; and Pass in CHEM2541 or CHEM2341	Y	Y	1	Dec	60	Dr Y F Wang, Chemistry	Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Chemistry (2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3146	Principles and applications of spectroscopic and analytical techniques	6	Pass in any CHEM2XXX level course	N	N			200	Dr X Li, Chemistry	Major in Chemistry (2014,2013)	Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3241	Analytical chemistry II: chemical instrumentation	6	Pass in CHEM2241	Y	Y	1	Dec	104	Dr W T Chan, Chemistry	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3242	Food and water analysis	6	Pass in CHEM2041 or CHEM2241 or CHEM2341 or CHEM2441 or CHEM2541. Please note that School of Biological	Y	Y	2	Мау	50	Dr W T Chan, Chemistry		Major in Chemistry (2014,2013); Major in Environmental Science (2017,2016,2015,2014,	

			Sciences stipulates that students who have passed in CHEM3242 are not allowed to take BIOL3209 Food and nutrient analysis.								2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental Science (2017,2016,2015,2014, 2013)	
CHEM3243	Introductory instrumental chemical analysis	6	Pass in CHEM2041 or CHEM2241; and Not for students who have passed CHEM3241, or have already enrolled in this course.	Y	Y	2	May	30	Dr X Li, Chemistry		Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3244	Analytical techniques for pharmacy students	6	Pass in BPHM2136 (This course is for BPharm students only)	Y	Y	2	May	35	Dr X Li, Chemistry		Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3341	Inorganic chemistry II	6	Pass in CHEM2341	Y	Y	1	Dec	110	Prof V W W Yam, Chemistry	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3342	Bioinorganic chemistry	6	Pass in CHEM2341	Y	Y	2	May	50	Prof H Z Sun, Chemistry		Major in Chemistry (2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3441	Organic chemistry II	6	Pass in CHEM2441 [Remarks: CHEM3441 has been changed to lecture-based course from semester 2, 2015-16. For Chemistry students who admitted in 2014-15 or before, they must enroll also CHEM3443 for enrolling CHEM3441 (new version without lab component) to meet the Chemistry Major requirements.]	Y	Y	1, 2	Dec, May	300	Dr X Y Li (1st sem); Prof D Yang (2nd sem), Chemistry	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3442	Organic chemistry of biomolecules	6	Pass in CHEM2442 or CHEM3441	Y	Y	1	Dec	50	Dr P H Toy, Chemistry		Major in Chemistry (2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3443	Organic chemistry laboratory	6	Pass in CHEM2441; and pass in CHEM3441, or already enrolled in this course; NOT for students who have passed CHEM3441A in semester 1, 2015-16, or CHEM3441 in or before 2014-2015 (for students admitted in 2014-15 or before) Pass in CHEM2441 or CHEM2442 or CHEM2443; and Pass in CHEM3441 or CHEM3442, or already enrolled in any of these two courses (for students admitted in 2015-16 or thereafter)	Y	Y	1, 2	Dec, May	80	Dr A M Y Yuen, Chemistry	Major in Chemistry (2020,2019,2018,2017, 2016,2015); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Chemistry (2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3445	Integrated laboratory	6	Pass in CHEM3443 or already enrolled in this course	Y	Y	S	No exam	20	Dr A M Y Yuen, Chemistry	Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Chemistry (2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3541	Physical chemistry: Introduction to quantum chemistry	6	Pass in CHEM2541	Y	Y	1	Dec	100	Prof G H Chen, Chemistry	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive)	Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	

										(2020,2019,2018,2017, 2016,2015)		
CHEM3542	Physical chemistry: statistical thermodynamics and kinetics theory	6	Pass in CHEM2541	Y	Y	2	May	50	Dr. J Yang, Chemistry	Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Chemistry (2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM3999	Directed studies in chemistry	6	Pass in at least 24 credits of advanced level disciplinary core/elective chemistry courses (CHEM3XXX or CHEM4XXX) in the Chemistry Major including a pass in CHEM2341 or CHEM2441 or CHEM2442 or CHEM2441 or CHEM3146. This capstone course is for Chemistry Major (Intensive) students only. This course is designed for third year students who would like to take an early experience on research. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2	No exam		Prof D L Phillips, Chemistry		Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)
CHEM4142	Symmetry, group theory and applications	6	Pass in CHEM3341	Y	Y	1	Dec	60	Prof V W W Yam, Chemistry	Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM4143	Interfacial science and technology	6	Pass in CHEM3143 or CHEM3541 or CHEM3542	Y	Z	2	Мау	50	Prof G K Y Chan, Chemistry		Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM4144	Advanced materials	6	Pass in CHEM3143	Y	Y	2	Мау	30	Dr E C M Tse, Chemistry	Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM4145	Medicinal chemistry	6	Pass in CHEM3441 or CHEM3442; and Not for students who have passed in BPHM3133, or already enrolled in this course.	Y	Y	2	May	40	Dr Y Li, Chemistry		Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM4147	Supramolecular chemistry	6	Pass in CHEM3341 and CHEM3441	Y	Y	2	May	40	Dr H Y Au-Yeung, Chemistry		Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in	

											Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)
CHEM4148	Frontiers in Modern Chemical Science	6	Pass in CHEM3341 and CHEM3441.	Y	Y	2	May	60	Dr X Li, Chemistry		Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015); 2018,2017, 2016,2015,2014,2013)
CHEM4241	Modern chemical instrumentation and applications	6	Pass in CHEM3241	Y	Y	1	Dec	50	Dr I K Chu, Chemistry	Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)
CHEM4242	Analytical chemistry	6	Pass in CHEM3241 or CHEM3242	Y	Y	2	May	50	Dr W T Chan, Chemistry		Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)
CHEM4341	Advanced inorganic chemistry	6	Pass in CHEM3341	Y	Y	1	Dec	50	Prof C M Che, Chemistry		Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)
CHEM4342	Organometallic chemistry	6	Pass in CHEM3341	Y	Y	1	Dec	40	Dr H Y Au-Yeung, Chemistry		Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)
CHEM4441	Advanced organic chemistry	6	Pass in CHEM3441	Y	Y	1	Dec	40	Prof D Yang, Chemistry		Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)
CHEM4443	Integrated organic synthesis	6	Pass in CHEM3441; or Pass in CHEM3441 (without lab component) and CHEM3443	Y	Y	2	May	50	Dr Huang Z X, Chemistry		Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017,

										2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM4444	Chemical biology	6	Pass in BIOC3601 or CHEM3441	Y	Y	2	May	50	Prof X C Li, Chemistry	Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Chemistry (2020,2019,2018,2017,2016,2015,2014,2013); Minor in Chemistry (2020,2019,2018,2017,2016,2015,2014,2013)	
CHEM4541	Physical chemistry III: statistical thermodynamics and kinetics theory	6	Pass in CHEM3541	N	N			40	, Chemistry	Major in Chemistry (2013); Minor in Chemistry (2013)	
CHEM4542	Computational chemistry	6	Pass in CHEM3541 or PHYS3351	Y	N	2	May	50	Prof G H Chen, Chemistry	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM4543	Advanced physical chemistry	6	Pass in CHEM3541	Y	Y	2	May	40	Prof G H Chen, Chemistry	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM4544	Electrochemical science and technology	6	Pass in CHEM3241 or CHEM3541 or CHEM3542	N	Y			36	Prof G K Y Chan, Chemistry	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	
CHEM4910	Chemistry literacy and research	6	Pass in at least 24 credits of advanced level disciplinary core/elective chemistry courses (CHEM3XXX or CHEM4XXX) in the Chemistry Major including CHEM3241, and CHEM3341, and CHEM3441, and CHEM3441, and CHEM3541. This capstone course is for Chemistry Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	2	No exam		Dr X Li, Chemistry	Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)
CHEM4911	Capstone experience for chemistry	6	Students are expected to have	Y	Y	S	No exam		Dr A P L Tong,	Minor in Chemistry	 Major in Chemistry

	undergraduates: HKUtopia		satisfactorily completed all introductory chemistry disciplinary core courses and at least 24 credits of advanced level disciplinary core/elective chemistry courses in the Chemistry Major. Students who are interested in taking the course should contact the course coordinator for application in April - May. Late application may not be considered. This capstone course is for Chemistry Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.					Chemistry		(2020,2019,2018,2017, 2016,2015,2014,2013)	(2020,2019,2018,2017, 2016,2015,2014,2013)
CHEM4966	Chemistry internship	6	Pass in at least 24 credits of advanced level disciplinary core/elective chemistry courses (CHEM3XXX or CHEM4XXX) in the Chemistry Major. This capstone course is for Chemistry Major / Chemistry Major (Intensive) students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2, S	No exam	 Dr H Y Au-Yeung, Chemistry		Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)
CHEM4999	Chemistry project	12	Pass in at least 24 credits of advanced level disciplinary core/elective chemistry courses (CHEM3XXX or CHEM4XXX) in the Chemistry Major including CHEM3241, and CHEM3341, and CHEM3441, and CHEM3541. This capstone course is for Chemistry Major/ Chemistry Major (Intensive) students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	0	No exam	 Dr J Y Tang, Chemistry		Minor in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015)
School of Ch	inese	-	· ·	l	1		-	1			
CSCI9001	Practical Chinese for science students	6	NIL	Y	Y	1, 2	Dec, May	 Mr K W Wong, Chinese			
Department of	of Earth Sciences						1	'	1	•	
EASC1020	Introduction to climate science	6	NIL	Y	Y	2	May	 Dr Z H Liu, Earth Sciences		Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC1401	Blue Planet	6	NIL	Y	Y	1, 2	Dec, May	 Dr P Bach, Earth Sciences	Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Ecology & Biodiversity (Intensive) (2020,2019,2018,2017, 2016,2015); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC1402	Principles of geology	6	NIL	Y	Y	1	Dec	 Prof M Sun, Earth Sciences	Major in Earth System Science (2016,2015,2014,2013)	Minor in Earth Sciences (2020,2019,2018,2017,	

										; Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)	2016,2015,2014,2013)	
EASC1403	Geological heritage of Hong Kong	6	NIL	Y	Y	2	May	35	Prof M F Zhou, Earth Sciences			
EASC1404	Early life on earth	6	NIL	N	N			50	TBC, Earth Sciences			
EASC1405	Peaceful use of nuclear technologies	6	NIL	N	N				Dr S H Li, Earth Sciences			
EASC1406	Introduction to the earth-life system	6	Pass in EASC1401	Y	Y	2	No exam		Dr S Crowe, Earth Sciences	Major in Earth System Science (2020,2019,2018,2017)	Major in Earth System Science (2016,2015)	
EASC1407	Dinosaur Ecosystems	6	NIL	Y	Y	2	May		Dr M Pittman, Earth Sciences			
EASC2401	Fluid/solid interactions in earth processes	6	Pass in EASC1401 or EASC1402	Y	Y	2	No exam		Dr K H Lemke, Earth Sciences	Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)	Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC2402	Field and laboratory methods	6	Pass in EASC1401 or EASC1402	Y	Y	1	No exam	40	Dr J A King, Earth Sciences	Major in Earth System Science (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Geology (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Geology (Intensive) (2020, 2019, 2018, 2017, 2016, 2015)		
EASC2404	Introduction to atmosphere and hydrosphere	6	Pass in EASC1401 or EASC1402	Y	Y	1	Dec	50	Dr J R Ali, Earth Sciences	Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC2406	Geochemistry	6	Pass in EASC1402	Y	Y	1	Dec		Dr S H Li, Earth Sciences	Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)		
EASC2407	Mineralogy	6	Pass in EASC1402	Y	Y	1	Dec	30	Prof M Sun, Earth Sciences	Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)		
EASC2408	Planetary geology	6	Pass in EASC1401 or EASC1402 or PHYS1650	Y	Y	2	May		Dr M H Lee, Earth Sciences	Major in Astronomy (2017,2016,2015,2014, 2013)	Major in Geology (Intensive) (2020,2019,2018,2017,	

											2016,2015); Minor in Astronomy (2020,2019,2018)	
EASC2409	Regional field studies	6	Pass in EASC1401 or EASC1402; and consent of course coordinator	Y	Y	0	No exam	10	Dr J R Ali, Earth Sciences	Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)		
EASC2410	Data analysis and modeling in earth sciences	6	Pass in EASC1401	Y	Y	2	No exam		Dr B Zhang, Earth Sciences	Major in Earth System Science (2020,2019,2018,2017)		
EASC3020	Global change: anthropogenic impacts	6	Pass in EASC2404 or ENVS2001	Y	N	1	Dec		Dr Z H Liu, Earth Sciences		Major in Earth System Science (2020,2019,2018,2017); Major in Environmental Science (2020,2019,2018,2017,2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017,2016,2015); Minor in Earth Sciences (2020,2019,2018,2017,2016,2015,2014,2013); Minor in Environmental Science (2020,2019,2018,2017,2016,2015,2014,2013)	
EASC3402	Petrology	6	Pass in EASC2407	Y	Y	2	May		Prof G Zhao, Earth Sciences	Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)	Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC3403	Sedimentary environments	6	Pass in EASC2402 or EASC3402	Y	Y	2	May		Dr J King, Earth Sciences	Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC3404	Structural geology	6	Pass in EASC2402 and EASC3402	Y	Y	1	Dec	40	Dr J R Ali, Earth Sciences	Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)	Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC3405	Environmental remote sensing	6	Pass in EASC2404 or EASC2406 or EASC2407 or ENVS2002	Y	Y	2	No exam	54	Dr J Michalski, Earth Sciences		Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013);	

											Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC3406	Reconstruction of past climate	6	Pass in EASC2401	N	Y				Dr S H Li, Earth Sciences		Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC3408	Geophysics	6	Pass in EASC2401 or PHYS2250	Y	Y	2	No exam		Dr B Zhang, Earth Sciences	Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Earth System Science (2016,2015,2014,2013); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC3409	Igneous and metamorphic petrogenesis	6	Pass in EASC3402	Y	Y	2	May	30	Prof M Sun, Earth Sciences	Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)	Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC3410	Hydrogeology	6	Pass in EASC2402	Y	Y	1	Dec	40	Prof J J Jiao, Earth Sciences		Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC3412	Earth resources	6	Pass in EASC2402 or EASC3402	Y	Y	1	Dec	40	Prof M F Zhou, Earth Sciences		Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC3413	Engineering geology	6	Pass in EASC3410 and EASC3414, or already enrolled in these courses This course is only for final year students.	Y	Y	2	May	35	Dr L N Y Wong, Earth Sciences		Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive)	

EASC3414	Soil and rock mechanics	6	Pass in EASC3410, or already enrolled in this course	Y	Y	2	May	40	Prof J J Jiao, Earth Sciences		(2020,2019,2018,2017, 2016,2015); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013) Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Earth Sciences (2020,2019,2018,2017,	
EASC3415	Meteorology	6	Pass in EASC2404	Y	Y	1	No exam		Dr Jed Kaplan, Earth Sciences		2016,2015,2014,2013) Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC3416	Advanced geochemistry and geochronology	6	Pass in EASC2401 or EASC2406 or EASC2407	N	Z			50	Prof M F Zhou, Earth Sciences		Major in Earth System Science (2016,2015,2014,2013) : Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC3417	Earth through time	6	Pass in EASC3403	~	>	1	Dec	-	Dr S C Chang, Earth Sciences	Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC3418	Coasts and coastal change	6	Pass in EASC2401 and EASC2402 OR Pass in ENVS2001	Y	Y	2	May		Dr N Khan, Earth Sciences		Major in Earth System Science (2020,2019,2018,2017)	
EASC3419	Earth System Science Field Studies	6	Pass one of the following 2000-level courses: EASC2402 or ENVS2001 or GEOG2137 Or upon special arrangement with the course coordinator	N	Υ			15	Dr Jed O Kaplan, Earth Sciences		Major in Earth System Science (2020,2019,2018,2017) ; Major in Environmental Science (2020,2019,2018,2017, 2016,2015)	
EASC3999	Directed studies in earth sciences	6	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in the Geology or Earth System Science Majors; and Cumulative GPA of 2.5 or above. This course is not a capstone course and students cannot use this course to fulfill the capstone requirement of the	Y	Y	0	No exam		Dr Y Li, Earth Sciences		Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology	

			Earth System Science and Geology Majors. The earliest that a student is allowed to take this course is their year 3 study.								(Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)		
EASC4403	Biogeochemical cycles	6	Pass in EASC3403 or EASC3416 or ENVS3313	Y	Y	1	Dec		Dr Y Li, Earth Sciences	Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)		
EASC4406	Earth dynamics & global tectonics	6	Pass in EASC3403 or EASC3404 or EASC3408 or EASC3409	Y	Y	2	May		Prof G Zhao, Earth Sciences	Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)	Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)		
EASC4407	Regional geology	6	Pass in EASC3402; and (EASC3403 or EASC3404)	Y	Y	1	No exam	40	Dr A A G Webb, Earth Sciences	Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)		
EASC4408	Special topics in earth sciences	6	Pass in any EASC3XXX or EASC4XXX course	N	N			30	Dr M H Lee, Earth Sciences		Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (2020,2015,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)		
EASC4911	Earth system: contemporary issues	6	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in the Earth System Science Major including at least two of the following courses: EASC3410, EASC3415 or ENVS3313. This capstone course is for Earth System Science Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	2	No exam		Dr S C Chang, Earth Sciences		Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC4955	Integrated field studies	6	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in the Geology Major / Geology Major (Intensive). This must include either a PASS in, or student must be already enrolled in EASC3403, EASC3404 and EASC3409. This capstone course is for Geology Major/ Geology Major (Intensive) students only.	Y	Y	2	No exam	35	Dr J A King, Earth Sciences		Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)	

			The earliest that a student is allowed to take this capstone course is their year 3 study.									
EASC4966	Earth sciences internship	6	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in the Geology or Earth System Science Majors. This course is not a capstone course and students cannot use this course to fulfill the capstone requirement of the Earth System Science and Geology Majors. The earliest that a student is allowed to take this course is their year 3 study.	Y	Y	1, 2, S	No exam		Dr M C Cheung, Earth Sciences		Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
EASC4999	Earth sciences project	12	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in the Geology or Earth System Science Majors; and Cumulative GPA of 2.7 or above. This course is not a capstone course and students cannot use this course to fulfill the capstone requirement of the Earth System Science and Geology Majors. The earliest that a student is allowed to take this course is their year 3 study.	Y	Y	0	No exam		Dr Y Li, Earth Sciences	Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015)	Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Earth Sciences (2020,2019,2018,2017, 2016,2015,2014,2013)	
ENVS1401	Introduction to environmental science	6	NIL	Y	Y	1	Dec		Dr C Not, Earth Sciences	Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
ENVS2020	Biogeochemistry of the environment	6		Ν	N							
ENVS3007	Natural hazards and mitigation	6	Pass in EASC2404 or ENVS2001 or ENVS2002	N	Y				Dr N S KHAN, Earth Sciences		Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015); Olinor in Environmental Science (2020,2019,2018,2017, 2016,2015,2015,2014,2013)	
ENVS3042	Pollution	6	Pass in EASC2401 or CHEM2241 or BIOL2103 or ENVS2001	Y	Y	1	No exam	50	Dr B Thibodeau, Earth Sciences		Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
ENVS3313	Environmental oceanography	6	Pass in BIOL2306 or EASC2404 or ENVS2001 or ENVS2002	Y	Y	2	May		Dr M C Cheung, Earth Sciences	Minor in Marine Biology (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Earth System Science (2020,2019,2018,2017, 2016,2015,2014,2013);	

										Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Geology (Intensive) (2020,2019,2018,2017, 2016,2015); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
ENVS3999	Directed studies in environmental science	6	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in Environmental Science Major. Cumulative GPA of 2.5 or above in Environmental Science Major. This capstone course is for Environmental Science Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2	No exam		Dr C Dingle, Biological Sciences		Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)
ENVS4955	Environmental science in practice	6	Pass in at least 12 credits of advanced level (level 3 or 4) disciplinary core/elective courses in Environmental Science Major.	N	N			8	Dr M Yasuhara, Biological Sciences		Major in Environmental Science (2014,2013)
ENVS4966	Environmental science internship	6	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in Environmental Science Major. This capstone course is for Environmental Science Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2, S	No exam		Dr C Dingle, Biological Sciences		Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)
ENVS4999	Environmental science project	12	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in Environmental Science Major; and Students must have a cumulative GPA of 3.0 or above in Environmental Science Major. This capstone course is for Environmental Science Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	0	No exam		Dr C Dingle, Biological Sciences		Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)
Department of	of Mathematics										
MATH1009	Basic mathematics for business and economics	6	NIL The course has no pre-requisite, but students are expected to have already achieved Level 2 or above in HKDSE Mathematics or equivalent. Not for students who have passed MATH1011 or MATH1013, or have already enrolled in these courses. This course is exclusively for non- Science and non-Engineering students (i.e. not for students from the Faculty of Science or Engineering).	Y	Y	1, 2	Dec, May	440	Dr Y M Chan (1st sem); Dr K H Law (2nd sem), Mathematics		
MATH1011	University mathematics I	6	Not for the following students: (a) with Level 2 or above in M1 or M2 of HKDSE	Y	Y	1, 2	Dec, May	400	Dr H Y Zhang, Mathematics	Major in Chemistry (Intensive)	

			Math or equivalent; (b) have passed or already enrolled in any of following courses: MATH1009, 1013, 1821, 1851, level 2 or above math courses; (c) have passed MATH1853.								(2020,2019,2018,2017, 2016,2015); Major in Molecular Biology & Biotechnology (Intensive) (2020,2019,2018,2017, 2016,2015)	
MATH1013	University mathematics II	6	Level 2 or above in Module 1, or Module 2 of HKDSE Mathematics or equivalent, or Pass in MATH1009 or MATH1011; and Not for students who have passed MATH1821, or (MATH1851 and MATH1853), or have already enrolled in this course.	Y	Y	1, 2	Dec, May	500	Dr C W Wong, Mathematics	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics (2017,2016,2015,2014,2013); Major in Risk Management (2020,2019,2018,2017,2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017,2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017,2016,2015,2014,2013); Minor in Computational & Financial Mathematics (2020,2019,2018,2017,2016,2015,2014,2013); Minor in Mathematics (2020,2019,2018,2017,2016,2015,2014,2013); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017,2016,2015,2014,2013)	Major in Chemistry (Intensive) (Intensive) (2020, 2019, 2018, 2017, 2016, 2015); Major in Molecular Biology & Biotechnology (Intensive) (2020, 2019, 2018, 2017, 2016, 2015); Major in Physics (Intensive) (2020, 2019, 2018, 2017, 2016); Milinor in Actuarial Studies (2020, 2019, 2018, 2017, 2016, 2015); Milinor in Actuarial Studies (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013)	
MATH1641	Mathematical laboratory and modeling	6	NIL	N	N			30	TBC, Mathematics			
MATH1821	Mathematical methods for actuarial science I	6	Level 4 or above in HKDSE Mathematics plus Module 1, or Level 4 or above in HKDSE Mathematics plus Module 2, or equivalent; and Not for students who have passed MATH1013 or (MATH1851 and MATH1853), or have already enrolled in these courses. For BSc(ActuarSc) students only.	Y	Y	1	Dec		Dr C W Wong, Mathematics	BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
MATH1851	Calculus and ordinary differential equations	6	Level 2 or above in Module 1, or Module 2 of HKDSE Mathematics or equivalent, or Pass in MATH1011. (This course is exclusively for Engineering students.)	Y	Y	1, 2	Dec, May	700	Prof Y K Lau (1st sem); Dr X Zhang (2nd sem), Mathematics			
MATH1853	Linear algebra, probability and statistics	6	Level 2 or above in Module 1, or Module 2 of HKDSE Mathematics or equivalent, or Pass in MATH1011, or take MATH1011 and MATH1853 concurrently in the same semester.	Y	Y	1, 2	Dec, May	700	Prof G Han, Mathematics			

			(This course is exclusively for Engineering students.)									
MATH2012	Fundamental concepts of mathematics	6	Pass in MATH1013 or MATH1821 or (MATH1851 and MATH1853). Students with good grades in HKDSE Math Module 1 or Math Module 2 (or other equivalent qualifications) and have strong interests in math may also apply for taking this course concurrently with its prerequisites courses (subject to the approval from Course Selection Advisors).	Y	Y	1, 2	Dec, May	1	Dr Y M Chan, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016)	Minor in Computational & Financial Mathematics (2020,2019,2018,2017, 2016,2015); Minor in Mathematics (2020,2019,2018,2017, 2016,2015); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015)	
MATH2014	Multivariable calculus and linear algebra	6	Pass in MATH1013 or (MATH1851 and MATH1853). Not for students who have passed MATH2822 or [(MATH2101 or MATH2102) and MATH2211], or have already enrolled in these courses.	Y	Y	1, 2	Dec, May	1	Dr H Y Zhang, Mathematics	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014)	Minor in Computational & Financial Mathematics (2020,2019,2018,2017, 2016,2015); Minor in Mathematics (2020,2019,2018,2017, 2016,2015); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015)	
MATH2101	Linear algebra I	6	Pass in MATH1013 or MATH1821 or (MATH1851 and MATH1853)	Y	Y	1, 2	Dec, May		Dr K H Law (1st & 2nd sem); Dr T W Ching (1st sem), Mathematics	Major in Mathematics (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Mathematics (Intensive) (2020, 2019, 2018, 2017, 2016); Major in Mathematics/Physics (2017, 2016, 2015, 2014, 2013); Minor in Computational & Financial Mathematics (2014, 2013); Minor in Mathematics (2014, 2013); Minor in Operations Research & Mathematical Programming (2014, 2013)	Minor in Computational & Financial Mathematics (2020,2019,2018,2017, 2016,2015); Minor in Mathematics (2020,2019,2018,2017, 2016,2015); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015)	
MATH2102	Linear algebra II	6	Pass in MATH2101 or (MATH1821 and MATH2822)	Y	Y	2	May	-	Dr T W Ching, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016)		
MATH2211	Multivariable calculus	6	Pass in MATH1013 or MATH1821 or (MATH1851 and MATH1853)	Y	Y	1, 2	Dec, May		Dr T W Ching, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Computational &	Minor in Computational & Financial Mathematics (2020,2019,2018,2017, 2016,2015); Minor in Mathematics (2020,2019,2018,2017, 2016,2015); Minor in Operations Research & Mathematical Programming	

										Financial Mathematics (2014,2013); Minor in Mathematics (2014,2013); Minor in Operations Research & Mathematical Programming (2014,2013)	(2020,2019,2018,2017, 2016,2015)	
MATH2241	Introduction to mathematical analysis	6	Pass in MATH1013 or (MATH1851 and MATH1853) or MATH2822. Students are strongly recommended to have taken MATH2012 if they wish to take this course.	Y	Y	1, 2	Dec, May	-	Dr T W Ching (1st sem); Dr Y M Chan (2nd sem), Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016)		
MATH2822	Mathematical methods for actuarial science II	6	Pass in MATH1821. For BSc(ActuarSc) students only.	Y	Y	2	May		Dr T W Ching, Mathematics	BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
MATH3001	Development of mathematical ideas	6	Pass in MATH2101, MATH2102, MATH2211 and MATH2241	N	Z			1	TBC, Mathematics		Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH3002	Mathematics seminar	6	Pass in MATH2012, MATH2101, MATH2211 and MATH2241 Subject to approval by the Department.	Y	Y	2	No exam	12	Prof T W Ng; Dr Y M Chan, Mathematics	Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016)	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH3301	Algebra I	6	Pass in MATH2101	Y	Y	1	Dec		Prof Y K Lau, Mathematics	Major in Mathematics (2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013)	Major in Mathematics (2020,2019,2018,2017, 2016,2015); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH3303	Matrix theory and its applications	6	Pass in MATH2101 and MATH2102	N	Z				Dr Y M Chan, Mathematics		Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH3304	Introduction to number theory	6	Pass in MATH2101 and MATH2211	Y	Y	2	May		Dr B Kane, Mathematics		Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in	

											Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH3401	Analysis I	6	Pass in MATH2211	Y	Y	1	Dec		Prof W S Cheung, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013)	Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH3403	Functions of a complex variable	6	Pass in MATH2211 and MATH2241	Y	Y	2	May	l	Dr K K Wong, Mathematics	Major in Mathematics (2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016)	Major in Mathematics (2020,2019,2018,2017, 2016,2015); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH3405	Differential equations	6	Pass in (MATH2101 and MATH2211) or MATH2014 or (MATH1821 and MATH2822)	Y	Y	2	May		Dr H Y Zhang, Mathematics	Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016)	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH3408	Computational methods and differential equations with applications	6	Pass in (MATH2101 and MATH2211) or MATH2014 or (MATH1821 and MATH2822)	Y	Y	2	May		Prof W K Ching, Mathematics		Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Environmental Science (2017,2016,2015,2014, 2013); Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Computational & Financial Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH3541	Introduction to topology	6	Pass in MATH2101, MATH2102 and MATH2241. Students are recommended to have passed or already enrolled in MATH3301 and MATH3401.	N	Y				Prof J H Lu, Mathematics		Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017,

										2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH3600	Discrete mathematics	6	Pass in (MATH1013 and any 1 of Level 2 MATH courses) or (MATH1851 and MATH1853 and any 1 of level 2 MATH courses) or MATH2014 or (MATH1821 and MATH2822)	Y	Y	1	Dec	 Dr K H Law, Mathematics	Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016)	Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015,2014,2013);
MATH3601	Numerical analysis	6	Pass in (MATH2101 and MATH2211) or MATH2014 or (MATH1821 and MATH2822)	Y	Y	1	Dec	 Dr Z Zhang, Mathematics	Minor in Computational & Financial Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (1016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH3603	Probability theory	6	Pass in (MATH2101 and MATH2211) or MATH2014 or (MATH1821 and MATH2822)	Y	Y	1	Dec	 Dr Z Qu, Mathematics	Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016)	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Computational & Financial Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH3901	Operations research I	6	Pass in MATH2014 or MATH2101 or MATH2102	Y	Y	1	Dec	 Dr Z Qu, Mathematics	Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015,2014,2013)	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Decision Analytics (2020,2019,2018,2017,

											2016,2015,2014,2013); Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH3904	Introduction to optimization	6	Pass in (MATH2101 and MATH2211) or MATH2014 or (MATH1821 and MATH2822)	Y	Y	1	Dec		Prof W Zang, Mathematics	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Computational & Financial Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Mathematics (2020,2019,2018,2017,2016,2015,2014,2013)	
MATH3905	Queueing theory and simulation	6	Pass in (MATH2101 and MATH2211) or MATH2014 or (MATH1821 and MATH2822)	N	Y			1	Dr G Han, Mathematics		Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH3906	Financial calculus	6	Pass in (MATH2101 and MATH2211) or MATH2014 or (MATH1821 and MATH2822) or STAT2601	Y	Y	2	May		Dr G Li, Mathematics	Minor in Computational & Financial Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Operations Research & Mathematical Programming	

									(2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH3911	Game theory and strategy	6	Pass in (MATH2101 and MATH2211) or (MATH1821 and MATH2822)	Y	Y	2	May	 Dr K H Law, Mathematics	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Mathematics (2020,2019); Major in Mathematics (2020,2019,2018,2017,2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017,2016); Major in Mathematics/Physics (2017,2016,2015,2014,2013); Minor in Computational & Financial Mathematics (2020,2019,2018,2017,2016,2015,2014,2013); Minor in Mathematics (2020,2019,2018,2017,2016,2015,2014,2013); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017,2016,2015,2014,2013)	
MATH3943	Network models in operations research	6	Pass in (MATH2101 and MATH2211) or MATH2014; and Pass in MATH3901, or already enrolled in this course.	N	Y	-		 Prof W Zang, Mathematics	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH3999	Directed studies in mathematics	6	This capstone course is for Mathematics / Mathematics (Intensive), and Mathematics/Physics Majors students only. The earliest that a student is allowed to take this capstone course is their year 3 study. Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX, MATH4XXX or MATH7XXX) in the Mathematics/ Mathematics (Intensive), and Mathematics/Physics Majors, in addition to a pass in MATH2101, MATH2102, MATH2211 and MATH2241; and subject to approval by	Y	Y	1, 2	No exam	 Prof X Yuan, Mathematics	Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013)

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MATH4302	Algebra II	6	Pass in MATH2102 and MATH3301	Y	Y	2	May	 Prof J H Lu, Mathematics		Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH4402	Analysis II	6	Pass in MATH3401	Y	Y	2	May	Dr Y M Chan, Mathematics		Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH4404	Functional analysis	6	Pass in MATH2101, MATH2102, MATH2211, MATH2241 and MATH3401	Y	Y	2	May	 Dr C W Wong, Mathematics	Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016)	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH4406	Introduction to partial differential equations	6	Pass in MATH2101, MATH2102, MATH2241; and Pass in MATH3405, or already enrolled in this course.	Y	Y	1	Dec	 Dr T K Wong, Mathematics	Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016)	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH4501	Geometry	6	Pass in (MATH2101 and MATH2211); and Pass in (MATH3401 or MATH3403 or MATH3405). Students are strongly recommended to have taken MATH3401.	Y	Y	1	Dec	 Dr Z Hua, Mathematics	Major in Mathematics/Physics (2017,2016,2015,2014, 2013)	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH4511	Introduction to differentiable manifolds	6	Pass in MATH3401 or MATH3541. It would be helpful if students have also taken or are concurrently taking MATH4402.	Y	N	2	May	 Prof J H Lu, Mathematics		Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics	

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										(2017,2016,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH4602	Scientific computing	6	Pass in MATH3601	Y	Y	2	May		Prof W K Ching, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Computational & Financial Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH4902	Operations research II	6	Pass in MATH2101, MATH2211 and MATH3603.	N	N	1			Dr G Han, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH4907	Numerical methods for financial calculus	6	Pass in MATH3906 or equivalent.	N	Y				Dr C W Wong, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Computational & Financial Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH4910	Senior mathematics seminar	6	This capstone course is for Mathematics / Mathematics (Intensive), and Mathematics/Physics Majors	Y	Y	2	No exam	12	Prof K P Ng; Dr T K Wong, Mathematics	Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013) Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013);

			students only. The earliest that a student is allowed to take this capstone course is their year 3 study. Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX, MATH4XXX, or MATH7XXX) in the Mathematics/ Mathematics (Intensive), and Mathematics/Physics Majors; and subject to approval by the Department.							Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013)
MATH4911	Mathematics capstone project	6	This capstone course is for Mathematics / Mathematics (Intensive), and Mathematics/Physics Majors students only. This course is for third and fourth year students only. The earliest that a student is allowed to take this capstone course is their year 3 study. Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX, MATH4XXX, or MATH7XXX) in the Mathematics/ Mathematics (Intensive), and Mathematics/Physics Majors; and subject to approval by the Department.	N	Y			 Prof T W Ng, Mathematics	Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013)
MATH4966	Mathematics internship	6	This capstone course is for Mathematics / Mathematics (Intensive), and Mathematics/Physics Majors students only. The earliest that a student is allowed to take this capstone course is their year 3 study. Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX, MATH4XXX, or MATH7XXX) in the Mathematics/ Mathematics (Intensive), and Mathematics/Physics Majors; and subject to approval by the Department.	Y	Y	1, 2, S	No exam	 Dr C W Wong, Mathematics	Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013)
MATH4999	Mathematics project	12	This capstone course is for Mathematics / Mathematics (Intensive), and Mathematics/Physics Majors students only. The earliest that a student is allowed to take this capstone course is their year 3 study. Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX, MATH4XXX, or MATH7XXX) in the Mathematics/ Mathematics (Intensive), and Mathematics/Physics Majors; and subject to approval by the Department.	Y	Y	0	No exam	 Prof X Yuan, Mathematics	Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013)
MATH7101	Intermediate complex analysis	6	Pass in a first course in Complex Analysis such as MATH3403, and approval by the course coordinator.	Y	Y	1	No exam	 Prof T W Ng; Dr. X Zhang, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH7201	Topics in geometry	6	Pass in (MATH4402 or MATH4501) and (MATH4511 or the approval of the	N	N			 TBC, Mathematics	Major in Mathematics (2020,2019,2018,2017,	

			course coordinator)						2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH7202	Complex manifolds	6	Pass in MATH3403 or MATH4501 or MATH7101.	Y	N	2	No exam	 Prof N Mok, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH7217	Topics in financial mathematics	6	Pass in an advanced level mathematics courses (MATH3XXX, MATH4XXX, or MATH7XXX) and subject to the approval of the course coordinator.	N	N			 TBC, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Computational & Financial Mathematics (2020,2019,2018,2017, 2016); Minor in Mathematics (2020,2019,2018,2017, 2016); Minor in Mathematics (2020,2019,2018,2017, 2016); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
MATH7219	Topics in applied functional analysis	6	Pass in MATH3401 and MATH4404, or approval of the course coordinator.	N	N			 TBC, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014, 2013)	
MATH7224	Topics in advanced probability theory	6	Pass in MATH3603 and MATH4402, and approval of the course coordinator.	N	N			 TBC, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Computational & Financial Mathematics (2020,2019,2018,2017, 2016); Minor in Mathematics (2020,2019,2018,2017, 2016); Minor in Mathematics (2020,2019,2018,2017, 2016); Minor in Mathematics (2020,2019,2018,2017, 201	

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MATH7501	Topics in algebra	6	Pass in MATH4302	N	Y				Dr Z Hua, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH7502	Topics in applied discrete mathematics	6	Pass in (MATH3301 or MATH3600), and approval of the course coordinator.	Y	N	2	May		Prof W Zang, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Operations
MATH7503	Topics in mathematical programming and optimization	6	Pass in MATH3901, MATH3904 and (MATH4902 or the approval of the course coordinator)	Y	Y	2	No exam	-	Prof X Yuan, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics (Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Operations Research & Mathematical Programming (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH7504	Geometric topology	6	Pass in MATH3301 and MATH3401	N	N				TBC, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)
MATH7505	Real analysis	6	A good grade in MATH3401 and approval by the course coordinator	Y	Y	2	May		Prof W S Cheung, Mathematics	Major in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Mathematics

										(Intensive) (2020,2019,2018,2017, 2016); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Minor in Mathematics (2020,2019,2018,2017, 2016,2015,2014,2013)	
Department of	of Physics										
PHYS1000	Introduction to astronomy	6	Nil	Ν	N			 Dr K M Lee, Physics			
PHYS1001	University physics	6	NIL	Ν	N			 Dr F K Chow, Physics			
PHYS1050	Physics for engineering students	6	Level 3 or above in HKDSE Physics or Combined Science with Physics components or equivalent; and (Level 2 or above in Module 1, or Module 2 of HKDSE Mathematics or equivalent, or Pass in MATH1011) (This course is exclusive for Engineering students.)	Z	N			 Dr C C Ling, Physics			
PHYS1055	How things work	6	NIL	Υ	Υ	2	May	 Dr M K Yip, Physics			
PHYS1056	Weather, climate and climate change	6	NIL	Υ	Υ	1	Dec	 Dr K M Lee, Physics			
PHYS1057	Kitchen science	6	NIL	N	N			 Prof A B Djurisic, Physics			
PHYS1150	Problem solving in physics	6	Level 3 or above in HKDSE Physics or equivalent, or Pass in PHYS1240	Y	Y	1, 2	Dec, May	 Dr M K Yip, Physics	Major in Physics (2014,2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016)	Major in Astronomy (2017,2016,2015); Major in Mathematics/Physics (2017,2016,2015); Major in Physics (2020,2019,2018,2017, 2016,2015); Minor in Physics (2020,2019,2018)	
PHYS1240	Physics by inquiry	6	NIL Not for students with level 3 or above in HKDSE Physics; and Not for students who have passed in PHYS1050 or PHYS1150 or PHYS1250, or already enrolled in these courses; and Not for students who have passed in any level 2 PHYS course or above.	Y	Y	2	May	 Dr M Su, Physics			
PHYS1250	Fundamental physics	6	Level 3 or above in HKDSE Physics or equivalent, or Pass in PHYS1240; and Not for students who have passed in PHYS1050, or already enrolled in this course; and Not for students who have passed in any level 2 PHYS course or above.	Y	Y	1, 2	Dec, May	 Dr F C C Ling, Physics	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2017,2016,2015,2014, 2013); Minor in Astronomy (2017,2016,2015,2014, 2013); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Astronomy (2020,2019,2018)	
PHYS1650	Nature of the universe	6	NIL	Y	Y	1, 2	Dec, May	 Dr K M Lee, Physics	Major in Astronomy (2017,2016,2015,2014, 2013); Minor in Astronomy (2020,2019,2018,2017,	Major in Physics (Intensive) (2020,2019,2018,2017, 2016)	

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PHYS2055	Introductory relativity	6	Pass in PHYS1050 or PHYS1150 or PHYS1250 or ENGG1300	Y	Y	1	Dec		Dr K M Lee, Physics	Major in Physics (Intensive) (2020,2019,2018,2017, 2016)	Major in Astronomy (2017,2016,2015); Major in Mathematics/Physics (2017,2016,2015); Major in Physics (2020,2019,2018,2017, 2016,2015); Minor in Astronomy (2020,2019,2018); Minor in Physics (2020,2019,2018)	
PHYS2150	Methods in physics I	6	Pass in MATH1013 or MATH1821 or MATH1851 or PHYS1150	Y	Y	1	Dec		Dr F K Chow, Physics	Major in Physics (Intensive) (2020,2019,2018,2017, 2016)	Major in Astronomy (2017,2016,2015); Major in Mathematics/Physics (2017,2016,2015); Major in Physics (2020,2019,2018,2017, 2016,2015); Minor in Physics (2020,2019,2018)	
PHYS2155	Methods in physics II	6	Pass in MATH1013 or MATH1821 or MATH1851 or PHYS1150	Y	Y	2	May		Dr K M Lee, Physics	Major in Physics (Intensive) (2020,2019,2018,2017, 2016)	Major in Astronomy (2017,2016,2015); Major in Mathematics/Physics (2017,2016,2015); Major in Physics (2020,2019,2018,2017, 2016,2015); Minor in Physics (2020,2019,2018)	
PHYS2160	Introductory computational physics	6	Pass in MATH1013 or MATH1821 or MATH1851 or PHYS1150	Y	Y	2	May	30	Dr F K Chow, Physics		Major in Physics (2020,2019,2018); Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Astronomy (2020,2019); Minor in Physics (2020,2019)	
PHYS2250	Introductory mechanics	6	Pass in PHYS1050 or PHYS1150 or PHYS1250 or ENGG1300	Y	Y	1, 2	Dec, May		Dr M K Yip, Physics	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2014,2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Physics (2017,2016); Minor in Physics (2017,2016,2015,2014, 2013)	Major in Mathematics/Physics (2017,2016,2015); Minor in Physics (2020,2019,2018)	
PHYS2255	Introductory electricity and magnetism	6	Pass in PHYS1050 or PHYS1150 or PHYS1250 or ENGG1310	Y	Y	2	May		Dr J C S Pun, Physics	Major in Astronomy (2014,2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) (2020,2019,2018,2017,	Major in Astronomy (2017,2016,2015); Major in Mathematics/Physics (2017,2016,2015); Minor in Physics (2020,2019,2018)	

										2016)		
PHYS2260	Heat and waves	6	Pass in PHYS1050 or PHYS1250	N	N				Dr M Su, Physics	Major in Physics (2017,2016,2015,2014, 2013)	Major in Astronomy (2017,2016,2015); Major in Mathematics/Physics (2017,2016,2015)	
PHYS2261	Introductory heat and thermodynamics	6	Pass in PHYS1050 or PHYS1150 or PHYS1250 or ENGG1350	Y	Y	1	Dec	-	Dr S Z Zhang, Physics	Major in Physics (2020,2019,2018); Major in Physics (Intensive) (2020,2019,2018,2017, 2016)	Minor in Physics (2020,2019,2018)	
PHYS2265	Introductory quantum physics	6	Pass in PHYS1050 or PHYS1150 or PHYS1250 or ENGG1300	Y	Y	1, 2	Dec, May		Dr F K Chow, Physics	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Astronomy (2017,2016,2015,2014, 2013); Minor in Physics (2017,2016,2015,2014, 2013); Minor in Physics (2017,2016,2015,2014, 2013)	Minor in Physics (2020,2019,2018)	
PHYS2650	Modern astronomy	6	Pass in PHYS1650	Y	Y	2	May		Dr J J L Lim, Physics	Minor in Astronomy (2020,2019,2018)	Major in Physics (Intensive) (2020,2019,2018,2017, 2016)	
PHYS2850	Atomic and nuclear physics	6	Pass in PHYS2265	N	N				Dr S Z Zhang, Physics			
PHYS3150	Theoretical physics	6	Pass in MATH2211 or PHYS2150 or PHYS2155	Y	Y	2	May		Dr C J Wang, Physics	Major in Physics (Intensive) (2020,2019,2018,2017, 2016)	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)	
PHYS3151	Machine learning in physics	6	Pass in MATH2014 or MATH2101 or MATH2211 or PHYS2155 or PHYS2160. Working knowledge of Python is needed (please talk to the course instructor in case of doubt).	Y	Y	1	Dec		Dr Z Y Meng, Physics		Major in Astronomy (2017,2016,2015); Major in Mathematics/Physics (2017,2016,2015); Major in Physics (2020,2019,2018,2017, 2016,2015); Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016,2015)	
PHYS3350	Classical mechanics	6	Pass in PHYS2150 and PHYS2250	Y	Y	1	Dec		Prof S Q Shen, Physics	Major in Mathematics/Physics	Major in Astronomy (2017,2016,2015,2014,	

										(2017,2016,2015,2014, 2013); Major in Physics (2017,2016,2015,2014, 2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016)	2013); Major in Physics (2020,2019,2018); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)	
PHYS3351	Quantum mechanics	6	Pass in PHYS2150 and PHYS2265, knowledge of PHYS2155 will be advantageous	Y	Y	1	Dec	1	Prof W Yao, Physics	Major in Mathematics/Physics (2017, 2016, 2015, 2014, 2013); Major in Physics (2017, 2016, 2015, 2014, 2013); Major in Physics (Intensive) (2020, 2019, 2018, 2017, 2016)	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)	
PHYS3450	Electromagnetism	6	Pass in PHYS2150 and PHYS2255, knowledge of PHYS2155 will be advantageous	Y	Y	2	May		Prof X D Cui, Physics	Major in Physics (2017,2016,2015,2014, 2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016)	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)	
PHYS3550	Statistical mechanics & thermodynamics	6	Pass in PHYS2150 and (PHYS2260 or PHYS2261)	Y	Y	2	May		Dr S Z Zhang, Physics	Major in Physics (2017,2016,2015,2014, 2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016)	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)	
PHYS3551	Introductory solid state physics	6	Pass in PHYS2260 and PHYS2265	N	N				Prof J Gao, Physics		Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2017,2016,2015,2014, 2013); Minor in Physics (2017,2016,2015,2014, 2013); Minor in	
PHYS3650	Observational astronomy	6	Pass in PHYS2255 or PHYS2650	Y	Y	1	Dec		Dr J J L Lim, Physics	Major in Astronomy (2017,2016,2015,2014, 2013); Minor in Astronomy (2020,2019,2018)	Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Astronomy (2017,2016,2015,2014, 2013); Minor in	

											Physics (2020,2019,2018,2017, 2016,2015,2014,2013)	
PHYS3651	The physical universe	6	Pass in PHYS1650 and (PHYS2250 or PHYS2265)	N	N				Dr K M Lee, Physics	Major in Astronomy (2017,2016,2015,2014, 2013)	Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2017,2016,2015,2014, 2013); Minor in Astronomy (2017,2016,2015,2014, 2013); Minor in Physics (2017,2016,2015,2014, 2013)	
PHYS3652	Principles of astronomy	6	Pass in PHYS1650 and (PHYS2250 or PHYS2265)	Z	N		1		Dr L X Dai, Physics	Major in Astronomy (2017,2016,2015,2014, 2013)	Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2017,2016,2015,2014, 2013); Minor in Astronomy (2017,2016,2015,2014, 2013); Minor in Physics (2017,2016,2015,2014, 2013)	
PHYS3653	Astrophysics	6	Pass in PHYS2250 or PHYS2265 or PHYS2650	Y	Y	2	May		Dr L X Dai, Physics		Major in Astronomy (2017,2016,2015); Major in Mathematics/Physics (2017,2016,2015); Major in Physics (2020,2019,2018,2017, 2016,2015); Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Astronomy (2020,2019,2018,2017, 2016,2015); Minor in Physics (2020,2019,2018,2017, 2016,2015); Minor in Physics (2020,2019,2018,2017, 2016,2015)	
PHYS3660	Astronomy laboratory	6	Pass in (PHYS2265 or PHYS2650); and Pass in PHYS3650, or already enrolled in this course.	Y	Y	1	Dec	9	Dr S C Y Ng, Physics		Major in Astronomy (2017, 2016, 2015); Major in Mathematics/Physics (2017, 2016, 2015); Major in Physics (2020, 2019, 2018, 2017, 2016, 2015); Major in Physics (Intensive) (2020, 2019, 2018, 2017, 2016); Minor in Astronomy (2020, 2019, 2018, 2017, 2016, 2015); Minor in Physics (2020, 2019, 2018, 2017, 2016, 2015); Minor in Physics (2020, 2019, 2018, 2017, 2016, 2015)	
PHYS3750	Laser and spectroscopy	6	Pass in PHYS2255 and PHYS2265	Y	Y	1	Dec		Dr T T Luu, Physics		Major in Astronomy (2017,2016,2015,2014, 2013); Major in	

											Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)	
PHYS3751	Physics of nanomaterials	6	Pass in PHYS3351; and Pass in PHYS3551, or already enrolled in this course.	N	N				TBC, Physics		Major in Astronomy (2017, 2016, 2015, 2014, 2013); Major in Mathematics/Physics (2017, 2016, 2015, 2014, 2013); Major in Physics (2017, 2016, 2015, 2014, 2013); Minor in Physics (2017, 2016, 2015, 2014, 2013)	
PHYS3760	Physics laboratory	6	Pass in any two of the following courses: PHYS3350, PHYS3351, PHYS3450, PHYS3550	Y	Y	2	May	16	Dr J H C Lee, Physics	Major in Physics (Intensive) (2020,2019,2018,2017, 2016)	Major in Astronomy (2017,2016,2015); Major in Mathematics/Physics (2017,2016,2015); Major in Physics (2020,2019,2018,2017, 2016,2015); Minor in Physics (2020,2019,2018,2017, 2016,2015)	
PHYS3850	Physical Optics	6	Pass in PHYS2250 and PHYS2255	Y	Y	2	May		Dr D K Ki, Physics		Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)	
PHYS3851	Atomic and nuclear physics	6	Pass in PHYS2265; and Pass in PHYS3351, or already enrolled in this course.	N	Y			-	Dr J H C Lee, Physics		Major in Astronomy (2017, 2016, 2015, 2014, 2013); Major in Mathematics/Physics (2017, 2016, 2015, 2014, 2013); Major in Physics (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Physics (Intensive) (2020, 2019, 2018, 2017, 2016); Minor in Physics (2020, 2019, 2018, 2017, 2016); Minor in Physics (2020, 2019, 2018, 2017,	

					l	ĺ	Ì			2016,2015,2014,2013)	1	
PHYS3999	Directed studies in physics	6	Pass in at least 24 credits of advanced level (3XXX level or above) disciplinary core/elective courses of the Physics Major, Physics (Intensive) Major, Mathematics/Physics Major or Astronomy Major curriculum. This capstone course is for Astronomy, Mathematics/Physics, Physics, and Physics (Intensive) Majors students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2, S	No exam	 Dr F C C Ling, Physics		Minor in Physics (2017,2016,2015,2014, 2013)		Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016)
PHYS4150	Computational physics	6	Pass in (MATH3301 or MATH3401 or MATH3403 or MATH3405 or PHYS3150); and Pass in any three of the following courses: PHYS3350, PHYS3351, PHYS3450, PHYS350	N	Y			 Prof J Wang, Physics		Major in Astronomy (2017, 2016, 2015, 2014, 2013); Major in Mathematics/Physics (2017, 2016, 2015, 2014, 2013); Major in Physics (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Physics (Intensive) (2020, 2019, 2018, 2017, 2016); Minor in Physics (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013)		
PHYS4151	Data analysis and modeling in physics	6	Pass in (MATH3301 or MATH3401 or MATH3403 or MATH3405 or PHYS3150); and Pass in any one of the following courses: PHYS3350, PHYS3351, PHYS3450, PHYS350	Y	Y	2	May	 Prof H F Chau, Physics		Major in Astronomy (2017, 2016, 2015, 2014, 2013); Major in Mathematics/Physics (2017, 2016, 2015, 2014, 2013); Major in Physics (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Physics (Intensive) (2020, 2019, 2018, 2017, 2016); Minor in Physics (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013, 2016, 2015, 2014, 2013)		
PHYS4350	Advanced classical mechanics	6	Pass in PHYS3350	N	N			 Prof S Q Shen, Physics		Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2017,2016,2015,2014, 2013); Minor in Physics (2017,2016,2015,2014, 2013)		
PHYS4351	Advanced quantum mechanics	6	Pass in PHYS3351	Y	Y	2	May	 Dr Y Wang, Physics	Major in Mathematics/Physics (2017,2016,2015,2014, 2013)	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive)		

									(2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)
PHYS4450	Advanced electromagnetism	6	Pass in PHYS3450	Y	Y	1	Dec	 Prof X D Cui, Physics	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)
PHYS4550	Advanced statistical mechanics	6	Pass in PHYS3550	Y	N	1	Dec	 Dr Y J Tu, Physics	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics ((ntensive) (2020,2019,2018,2017, 2016); Minor in Physics ((2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)
PHYS4551	Solid state physics	6	Pass in (PHYS2255 or PHYS2260) and PHYS3351	Y	Y	1	Dec	 Prof M H Xie, Physics	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics ((ntensive) (2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)
PHYS4650	Stellar physics	6	Pass in PHYS3351 and PHYS3651	N	Y			 Dr S C Y Ng, Physics	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) ((2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) ((2020,2019,2018,2017, 2016); Minor in Astronomy

PHYS4651	Selected topics in astrophysics	6	Pass in PHYS3351 or PHYS3450 or PHYS3550 or PHYS3651	N	N			 Prof K S Cheng, Physics	(2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013) Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2017,2016,2015,2014, 2013); Minor in Astronomy (2017,2016,2015,2014, 2013); Minor in Astronomy (2017,2016,2015,2014, 2013); Minor in Physics (2017,2016,2015,2014, 2013); Minor in Physics (2017,2016,2015,2014, 2013); Minor in Physics (2017,2016,2015,2014,
PHYS4652	Planetary science	6	Pass in PHYS3651 or (PHYS3350 and PHYS3550)	N	Y			 Dr M H Lee, Physics	2013) Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Astronomy (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)
PHYS4653	Cosmology	6	Pass in PHYS3651 or PHYS3652	Y	N	2	May	 Dr K M Lee, Physics	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Astronomy (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013);
PHYS4654	General relativity	6	Pass in PHYS2055 and PHYS3350	Y	Y	1	Dec	 Dr M Su, Physics	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013);

										Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Astronomy (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)	
PHYS4655	Interstellar medium	6	Pass in PHYS3651 or (PHYS3351 and PHY3550)	Y	N	1	Dec	-	Dr M H Lee, Earth Sciences	Major in Astronomy (2017, 2016, 2014, 2013); Major in Mathematics/Physics (2017, 2016, 2015, 2014, 2013); Major in Physics (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Physics (Intensive) (2020, 2019, 2018, 2017, 2016); Minor in Astronomy (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Minor in Physics (Intensive) (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Minor in Physics (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013)	
PHYS4656	Advanced astrophysics	6	Pass in PHYS3651 or PHYS3653 or (PHYS3351 and PHYS3450)	N	Y	1		-	TBA, Physics	Major in Astronomy (2017,2016,2015); Major in Mathematics/Physics (2017,2016,2015); Major in Physics (2020,2019,2018,2017, 2016,2015); Major in Physics (2020,2019,2018,2017, 2016); Minor in Astronomy (2020,2019,2018,2017, 2016,2015); Minor in Physics (2020,2019,2018,2017, 2016,2015); Minor in Physics (2020,2019,2018,2017, 2016,2015)	
PHYS4750	Experimental physics	6	TBC	N	N				TBC, Physics	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2017,2016,2015,2014, 2013); Minor in Physics (2017,2016,2015,2014, 2013)	
PHYS4850	Particle physics	6	Pass in PHYS3351	Y	Y	2	May		Dr Y J Tu, Physics	Major in Astronomy (2017, 2016, 2015, 2014, 2013); Major in Mathematics/Physics (2017, 2016, 2015, 2014, 2013); Major in Physics (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013);	

level (3XXX level or above) disciplinary core/elective courses of the Physics Major, Physics (Intensive) Major, Mathematics/Physics Major or Astronomy Major curriculum. This capstone course is for Astronomy, Mathematics/Physics, and Physics (Intensive) Majors students only. The earliest that a student is allowed to	PHYS4966	Physics internship	6	Pass in at least 24 credits of advanced level (3XXX level or above) disciplinary core/elective courses of the Physics Major, Physics (Intensive) Major, Mathematics/Physics Major or Astronomy Major curriculum. This capstone course is for Astronomy, Mathematics/Physics, Physics, and Physics (Intensive) Majors students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	S	No exam		Dr J C S Pun, Physics	Major in Physics (Intensive) (2020,2019,2018,20 2016); Minor in Physics (2020,2019,2018,20 2016,2015,2014,201 Minor in Physics (2017,2016,2015,20 2013)	7,	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016)
PHYS7351 Graduate quantum mechanics Pass in PHYS4351 Y Y Z May Prof S Q Shen, Physics (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2020,2019,2018,2017, 2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014, 2013); Major in Astronomy (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Mathematics/Physics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016);	PHYS4999	Physics project	12	level (3XXX level or above) disciplinary core/elective courses of the Physics Major, Physics (Intensive) Major, Mathematics/Physics Major or Astronomy Major curriculum. This capstone course is for Astronomy, Mathematics/Physics, Physics, and Physics (Intensive) Majors students only. The earliest that a student is allowed to take this capstone course is their year 3	Y	Y	0	No exam		Dr J J L Lim, Physics	(2017,2016,2015,20	4,	(2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (Intensive) (2020,2019,2018,2017,
Physics (2017,2016,2015,2014, 2013); Major in Mathematics (2017,2016,2015,2014, 2013); Major in Physics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Physics (1016,2015,2014,2013); Major in Physics (1016,2015,2014,2013); Major in Physics (1016,2015,2014,2017, 2016,2015,2014,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016); Minor in Physics (2020,2018,2017, 2016); Minor in Physics (2020,2018	PHYS7350	Graduate classical mechanics	6	Pass in PHYS4350	N	N			_	TBC, Physics	(2017,2016,2015,20 2013); Major in Mathematics/Physics: (2017,2016,2015,20 2013); Major in Physics (2020,2019,2018,20 2016,2015,2014,201 Major in Physics (Intensive) (2020,2019,2018,20 2016); Minor in Physics (2020,2019,2018,20 2016); Minor in Physics (2020,2019,2018,20	7,	
PHYS7450 Graduate electromagnetism 6 Pass in PHYS4450 Y Y 1 Dec Prof Z D Wang, Major in Astronomy								·		Physics	(2017,2016,2015,20 2013): Major in Mathematics/Physics (2017,2016,2015,20 2013): Major in Physics (2020,2019,2018,20 2016,2015,2014,201 Major in Physics (Intensive) (2020,2019,2018,20 2016): Minor in Physics (2020,2019,2018,20 2016): Minor in Physics (2020,2019,2018,20 2016): Minor in	4, 7, 3): 7,	

								Physics	201: Matt (201 201; Phys (202 2016 Maja (Inte (202 2011; Phys	20,2019,2018,2017, 6,2015,2014,2013); or in Physics ensive) 20,2019,2018,2017, 6); Minor in	
PHYS7550	Graduate statistical mechanics	6	Pass in PHYS4550	Y	Y	2	May	 Dr G Chen, Physics	(201 2011) Material (201 2011) Phys (202 2016) Majci (Intel (202 2016) Phys	20,2019,2018,2017, 6,2015,2014,2013); or in Physics ensive) 20,2019,2018,2017, 6); Minor in	
PHYS7551	Graduate solid state physics	6	Pass in PHYS3551 and PHYS4351	N	N			 Prof J Wang, Physics	(201) 2013 Matt (201) 2013 Phys (201) 2013	17,2016,2015,2014, 3); Minor in sics 17,2016,2015,2014,	
PHYS7650	Stellar atmospheres	6	TBC	N	N			 TBC, Physics	(201) 201: Matt (201) 201: Phys (201) 201: Astr (201) 2013	17,2016,2015,2014, 3); Minor in onomy 17,2016,2015,2014, 3); Minor in sics 17,2016,2015,2014,	
PHYS7750	Nanophysics	6	Pass in PHYS3551 and PHYS4351	Y	Y	1	Dec	 Dr D K Ki, Physics	(201 2013 Matt (201 2013 Phys (202	or in Astronomy 17,2016,2015,2014, 3); Major in hematics/Physics 17,2016,2015,2014, 3); Major in sics 20,2019,2018,2017, 6,2015,2014,2013);	

											Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Physics (2020,2019,2018,2017, 2016,2015,2014,2013)	
ENVS3006	Environmental radiation	6	Pass in CHEM2041 or ENVS2001 or ENVS2002 or PHYS2265	N	Z				Dr J K C Leung, Physics		Major in Environmental Science (2014,2013); Minor in Environmental Science (2017,2016,2015,2014, 2013)	
ENVS3010	Sustainable energy and environment	6	Pass in CHEM2041 or ENVS2001 or ENVS2002 or PHYS2260	Y	Y	2	May		Prof A B Djurisic, Physics		Major in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Environmental Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
Faculty of So ENTR2001	Professional and leadership	6	Any level 1 undergraduate course	Υ	Υ	1	No exam	24	Dr R Law, Faculty	Minor in Science		
ENTR2001	development	0	Any level 1 undergraduate course	T	1	ı	NO exam	24	DI K Law, Faculty	Entrepreneurship (2020,2019,2018,2017, 2016)		
ENTR3001	Science-based innovation development	6	Pass in IIMT1611 and ENTR2001	Y	Y	2	No exam	24	Dr M Kotaka, Biomedical Sciences	Minor in Science Entrepreneurship (2020,2019,2018,2017, 2016)		
ENTR3002	Customer analysis and strategic marketing	6	Pass in IIMT1611 and ENTR2001	Y	Y	2	No exam	24	Dr R Law, Faculty	Minor in Science Entrepreneurship (2020,2019,2018,2017, 2016)		
ENTR4966	Entrepreneurship internship	6	Pass in ENTR3001 and ENTR3002 Students must be in their Year 3 study or beyond, as well as minoring in Science Entrepreneurship.	Y	Y	S	No exam	24	Dr R Law, Faculty	Minor in Science Entrepreneurship (2020,2019,2018,2017, 2016)		
ENTR4999	Entrepreneurship project	6	Pass in ENTR3001 and ENTR3002 Students must be in their Year 3 study or beyond, as well as minoring in Science Entrepreneurship.	Y	Y	1	No exam	24	Dr R Law, Faculty	Minor in Science Entrepreneurship (2020,2019,2018,2017, 2016)		
SCNC1111	Scientific method and reasoning	6	NIL (This course is compulsory for all students taking a Science major offered by the Faculty of Science, except those who are eligible for exemption. Students should take this course in their first year.)	Y	Y	1, 2	Dec, May		Dr R K W Lui, Faculty	Major in Astronomy (2017,2016,2015,2014, 2013); Major in Biochemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Biological Sciences (Intensive) (2020,2019,2018,2017); Major in Chemistry (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Chemistry (100,2016,2015,2014,2013); Major in Chemistry (1016,2015,2014,2017,2016,2015); Major in Decision Analytics (2020,2019,2018,2017,2016,2015); Major in Decision Analytics (2020,2019,2018,2017,		

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										2016,2015,2014,2013); Major in Earth System			
										Science			
										(2020,2019,2018,2017,			
		1							1	2016,2015,2014,2013); Major in Ecology &			
										Biodiversity			
										(2020,2019,2018,2017,			
										2016,2015,2014,2013);			
										Major in Ecology &			
										Biodiversity (Intensive) (2020,2019,2018,2017,			
										2016,2015); Major in			
										Environmental Science			
										(2020,2019,2018,2017, 2016,2015,2014,2013);			
										Major in Food &			
										Nutritional Science			
										(2020,2019,2018,2017, 2016,2015,2014,2013);			
										Major in Geology			
										(2020,2019,2018,2017,			
										2016,2015,2014,2013);			
		1							1	Major in Geology (Intensive)			
									1	(2020,2019,2018,2017,			
										2016,2015); Major in			
										Mathematics			
										(2020,2019,2018,2017, 2016,2015,2014,2013);			
										Major in Mathematics			
										(Intensive)			
										(2020,2019,2018,2017,			
										2016); Major in Mathematics/Physics			
										(2017,2016,2015,2014,			
										2013); Major in			
										Molecular Biology &			
										Biotechnology (2020,2019,2018,2017,			
										2016,2015,2014,2013);			
										Major in Molecular			
										Biology & Biotechnology			
										(Intensive)			
										(2020,2019,2018,2017,			
		1							1	2016,2015); Major in			
										Physics (2020,2019,2018,2017,			
										2016,2015,2014,2013);			
										Major in Physics			
									1	(Intensive)			
										(2020,2019,2018,2017, 2016); Major in Risk			
		1							1	Management			
									1	(2020,2019,2018,2017,			
										2016,2015,2014,2013); Major in Statistics			
										(2020,2019,2018,2017,			
									1	2016,2015,2014,2013)			
SCNC1112	Fundamentals of modern science	6	NIL	Υ	Υ	1, 2	Dec, May		Dr J C S Pun, Physics	Major in Astronomy			
		1	(This course is compulsory for all			·	' '		1 , , , , , , , , , , , , , , , , , , ,	(2017,2016,2015,2014,			
			students taking a Science major offered							2013); Major in			
			by the Faculty of Science. Students should take this course in their first							Biochemistry (2020,2019,2018,2017,			
			year.)						1	2016,2015,2014,2013);			
									1	Major in Biological			
										Sciences			
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								(2020,2019,2018,2017,		
								2016,2015,2014,2013);		
								2010,2013,2014,2013),		
								Major in Biological		
								Sciences (Intensive)		
								(2020,2019,2018,2017)		
								; Major in Chemistry		
								(2020,2019,2018,2017,		
								2016,2015,2014,2013);		
								Major in Chemistry		
								(Intensive)		
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								(2020,2019,2018,2017, 2016,2015); Major in		
								Decision Analytics		
								Decision Analytics (2020,2019,2018,2017,		
								(2020,2019,2016,2017,		
								2016,2015,2014,2013);		
								Major in Earth System		
								Science		
								(2020,2019,2018,2017,		
								2016,2015,2014,2013);		
								Major in Ecology &		
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								Biodiversity		
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								Major in Ecology &		I
								Biodiversity (Intensive)		
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								2016,2015); Major in		
								Environmental Science		
								(2020,2019,2018,2017,		
								2016,2015,2014,2013);		
								Major in Food &		
								Nutritional Science		
								(2020,2019,2018,2017,		
								2016,2015,2014,2013);		
								Major in Geology (2020,2019,2018,2017,		
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								2016,2015,2014,2013);		
								Major in Geology		
								(Intensive)		
								(2020,2019,2018,2017,		
								2016,2015); Major in		
								Mathematics		
								(2020,2019,2018,2017,		
								2016,2015,2014,2013);		
								2010,2013,2014,2013),		
								Major in Mathematics		
								(Intensive)		
								(2020,2019,2018,2017,		
								2016); Major in		
				ļ				Mathematics/Physics		
				ļ				(2017,2016,2015,2014,		
				ļ				2013); Major in		
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				ļ				Molecular Biology &		
				ļ				Biotechnology		
								(2020,2019,2018,2017,		
								2016,2015,2014,2013);		
								Major in Molecular		I
				ļ				Biology &		
								Biotechnology		
								(Intensive)		
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				ļ				2016,2015); Major in		
								Physics		
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								Major in Physics		I
				ļ				(Intensive)		
								(Intensive)		
				ļ				(2020,2019,2018,2017,		
				ļ				2016); Major in Risk		
				ļ				Management		
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										(2020,2019,2018,2017, 2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)		
SCNC1113	The big history of our planet: a scientific perspective on everything that has ever happened	6	Level 3 or above in at least one science subject at the pre-university level (HKDSE Physics, Chemistry, Biology, Combined/Integrated Science or equivalent) This course is not offered to students in the 6901 BSc or 6119 BEd&BSc programmes.	Z	Y			50	Dr W M Y Cheung, Faculty			
SCNC2121	Sustainable food production	6	Students are expected to have passed at least 30 credits of level 1 and/or level 2 science courses. Students will also need to pass an interview in order to be enrolled in the course.	N	Y			32	Dr H S El-Nezami, Biological Sciences			
SCNC2122	Marine life science: a North East Pacific perspective	6	Students are expected to have passed at least 30 credits of level 1 and/or level 2 science courses. Students will also need to pass an interview in order to be enrolled in the course.	Z	Y			32	Dr T Vengatesen, Biological Sciences			
SCNC3111	Frontiers of science honours seminar course	6	Pass in SCNC1111, SCNC1112 and a level 2 science course. Students who participated or will participate in ORF/SRF must take this course.	Y	Y	1	No exam	120	Dr R K W Lui, Faculty			
Department	of Statistics & Actuarial Science						!	-			l.	
APAI1001	Artificial intelligence: foundation, philosophy and ethics	6	For BASc(AppliedAI) students only.	Y	Y	1	Dec	20	Prof J J F Yao, Statistics & Actuarial Science	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019)		
APAI2001	Artificial intelligence: foundation, philosophy and ethics	6	Pass in COMP1117, MATH2014 and STAT2601; and For BASc(AppliedAI) students only.	N	N			20	Prof J J F Yao, Statistics & Actuarial Science			
APAI3001	Deep learning	6	ТВС	N	Y				TBC	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019)		
APAI3010	Image processing and computer vision	6	TBC	N	Y				TBC		Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019)	
APAI3021	Modern biostatistics	6	ТВС	N	Y				TBC		Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019)	
APAI3799	Directed studies in Applied AI	6	TBC	N	Y				TBC			Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019)
APAI4011	Natural language processing	6	TBC	N	Y				TBC		Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019)	
APAI4012	High-performance computing	6	ТВС	N	N				TBC		Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019)	
APAI4022	Omics data analysis	6	TBC	N	Y				TBC		Bachelor of Arts and	

											Sciences in Applied Artificial Intelligence (2020,2019)	
APAI4023	Medical image analysis	6	твс	N	N				TBC		Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019)	
APAI4099	Special topics of applied Al	6	TBC	N	Z				TBC		Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2020,2020,2020, 2020,2019,2019,2019,2 019,2019)	
APAI4766	Applied Al internship	6	TBC	N	Y				TBC			Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019)
APAI4798	Applied Al project	12	TBC	N	Y				TBC			Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019)
STAT1005	Essential skills for undergraduates: foundations of data science	6	Not for students who have passed in STAT1015, or already enrolled in this course; and Not for BASc(AppliedAI) and BASc (FinTech) students.	Y	Y	1	No exam	210	Prof J J F Yao, Statistics & Actuarial Science			
STAT1015	Introduction to data science	6	Not for students who have passed in STAT1005, or already enrolled in this course; and This course is exclusive for BASc (AppliedAI) and BASc(FinTech) students.	Y	Y	1	No exam	40	Prof J J F Yao, Statistics & Actuarial Science			
STAT1600	Statistics: ideas and concepts	6	Not for students who have passed in any of the following courses: STAT1602, STAT1603, STAT3902.	Y	Y	1, 2	Dec, May		Dr C W Kwan, Statistics & Actuarial Science	Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)		
STAT1601	Elementary statistical methods	6	Level 2 or above in HKDSE Mathematics or equivalent; and Not for students with Level 2 or above in HKDSE Mathematics Extended Module 1 or 2; and Not for students who have passed or already enrolled in any of the following courses: STAT2901, STAT1602, STAT2601, STAT1603, ECON1280	N	N				TBC, Statistics & Actuarial Science		Major in Chemistry (Intensive) (2020, 2019, 2018, 2017, 2016, 2015); Major in Environmental Science (2017, 2016, 2015, 2014, 2013); Minor in Risk Management (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Minor in Statistics (2020, 2019, 2018, 2017, 2016, 2019, 2018, 2017, 2016, 2015, 2014, 2013)	
STAT1602	Business statistics	6	Not for students who have passed or already enrolled in any of the following courses: STAT1601, STAT2601, STAT1603, STAT2901 or ECON1280 (This course is available to students pursuing a major/minor in Business only).	Y	Y	1, 2	Dec, May		Dr R W L Wong, Statistics & Actuarial Science		Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT1603	Introductory statistics	6	(Level 2 or above in HKDSE Mathematics Extended Module 1 or 2 or equivalent) or (Pass or already enrolled in any of	Y	Y	1, 2	Dec, May		Dr E K F Lam, Statistics & Actuarial Science		Major in Chemistry (Intensive) (2020,2019,2018,2017, 2016,2015); Major in	

			these courses: MATH1009, MATH1011, MATH1013, MATH1851, MATH1853); and Not for students who have passed or already enrolled in any of these courses: STAT1601, STAT1602, STAT2601, STAT2901								Environmental Science (2017,2016,2015,2014, 2013); Major in Physics (Intensive) (2020,2019,2018,2017, 2016); Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT2601	Probability and statistics I	6	Pass or already enrolled in MATH2014, or (MATH2101 and MATH2211), for students admitted in 2014 or thereafter; or Pass in MATH1013, or already enrolled in this course, for students admitted in 2013 or before; or Pass in MATH1851 and MATH1853, for students admitted in 2013 or before; and Not for students who have passed in STAT1603, or already enrolled in this course; Not for students who have passed in STAT2901, or already enrolled in this course; and Not for BSc(ActuarSc) students.	Y	Y	1, 2	Dec, May		Dr K P Wat, Statistics & Actuarial Science	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Actuarial Studies (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Minor in Risk Management (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Minor in Statistics (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013)	
STAT2602	Probability and statistics II	6	Pass in STAT2601; and Not for students who have passed in STAT3902, or already enrolled in this course.	Y	Y	1, 2	Dec, May		Dr K Zhu, Statistics & Actuarial Science	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Actuarial Studies (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT2603	Data management with SAS	6	Pass in STAT1600 or MATH1821, or already enrolled in this course	N	N				Dr G C S Lui, Statistics & Actuarial Science	Major in Risk Management (2013); Major in Statistics (2013)	Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT2604	Introduction to R programming and elementary data analysis	6	Pass or already enrolled in STAT1600 or MATH1821.	Y	Y	1	Dec	50	Dr Z Liu, Statistics & Actuarial Science		Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT2605	Demographic and socio-economic statistics	6	(Level 2 or above in HKDSE Mathematics or Level 2 or above in HKDSE Mathematics Extended Module 1 or 2 or equivalent); and Pass or already enrolled in BIOL2102, ECON1280, STAT1601, STAT1602, STAT2601, STAT1603, STAT2901	Y	N	2	May		Ms L M S Kwan, Statistics & Actuarial Science		Minor in Actuarial Studies (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT2901	Probability and statistics:	6	Pass in MATH1821 [for BSc(ActuarSc)	Y	Υ	2	May		Prof S M S Lee,	BSc in Actuarial	Minor in Actuarial	

	foundations of actuarial science		students] or already enrolled in this course, or Pass in MATH1013 or already enrolled in this course [for students outside the BSc(ActuarSc) programme]; and Not for students who have passed or enrolled in any of these courses: STAT1601, STAT1602, STAT1603, STAT2601						Statistics & Actuarial Science	Science (2020,2019,2018,2017, 2016,2015,2014,2013)	Studies (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT2902	Financial mathematics	6	Pass in STAT2901, or already enrolled in this course; and Not for students who have passed in STAT3615, or already enrolled in this course.	Y	Y	2	May		Prof K C Yuen, Statistics & Actuarial Science	BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
STAT3600	Linear statistical analysis	6	Pass in STAT2602; and Not for students who have passed in STAT3907, or have already enrolled in this course.	Y	Y	1, 2	Dec, May		Dr C Wang, Statistics & Actuarial Science	Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3602	Statistical inference	6	Pass in STAT2602 or STAT3902	Y	Y	1	Dec		Prof S M S Lee, Statistics & Actuarial Science		BSc in Actuarial Science (2017, 2016, 2015, 2014, 2013); Major in Statistics (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013); Minor in Statistics (2020, 2019, 2018, 2017, 2016, 2015, 2014, 2013)	
STAT3603	Stochastic processes	6	Pass in STAT2601; and Not for students who have passed in MATH3603, or have already enrolled in this course; and Not for students who have passed in STAT3903, or have already enrolled in this course.	Y	Y	1	Dec		Dr J T Y Wong, Statistics & Actuarial Science	Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3604	Design and analysis of experiments	6	Pass in STAT2602 or STAT3611 or STAT3902	Y	Z	1	Dec	23	Dr D Y Zhang, Statistics & Actuarial Science		Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3605	Quality control and management	6	Pass in BIOL2102 or (ECON1280 and any University level 2 course) or (STAT1601 and any University level 2 course) or (STAT1602 and any University level 2 course) or STAT2602 or (STAT1603 and any University level 2 course) or STAT3902	N	N				TBC, Statistics & Actuarial Science		Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3606	Business logistics	6	Pass in BIOL2102 or (ECON1280 and any University level 2 course) or (STAT1601 and any University level 2 course) or (STAT1602 and any University level 2 course) or (STAT1603 and any University level 2 course) or STAT2601 or (STAT1603 and any University level 2 course) or STAT2901; and Not for students who have passed MATH3901, or have already enrolled in this course.	Y	Y	1	Dec		Dr O T K Choi, Statistics & Actuarial Science		Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	

STAT3607	Statistics in clinical medicine and biomedical research	6	Pass in STAT2602 or STAT3902	N	N				Prof G Yin, Statistics & Actuarial Science		Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3608	Statistical genetics	6	Pass in STAT2602 or STAT3902	N	N			23	Prof T W K Fung, Statistics & Actuarial Science		Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3609	The statistics of investment risk	6	Pass in STAT2602, or already enrolled in this course, or Pass in (STAT1603 and any University level 2 course) or STAT3611 or STAT3614; and Not for students who have passed in FINA2320, or have already enrolled in this course; and Not for BSc(Actuarial Science) students	Y	Y	1	Dec		Dr K P Wat, Statistics & Actuarial Science	Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3610	Risk management and insurance	6	Pass in BIOL2102 or (ECON1280 and any University level 2 course) or (STAT1601 and any University level 2 course) or (STAT1602 and any University level 2 course) or STAT2601 or (STAT1603 and any University level 2 course) or STAT2901. (Not available to Actuarial Science students)	~	Z	2	May		Dr R W L Wong, Statistics & Actuarial Science		Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3611	Computer-aided data analysis	6	Pass in BIOL2102 or (ECON1280 and any University level 2 course) or (STAT1601 and any University level 2 course) or (STAT1601 and any University level 2 course) or (STAT1603 and any University level 2 course); and Not for students who have passed in or have already enrolled in any of these courses: STAT2601, STAT2901, STAT3616	Z	Z				Dr E K F Lam, Statistics & Actuarial Science		Major in Environmental Science (2017,2016,2015,2014, 2013); Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3612	Statistical machine learning	6	Pass in STAT2602 or (STAT1603 and any University level 2 course) or STAT3902; and Pass in STAT3600 or STAT3907, or already enrolled in these courses; and Not for students who have passed in STAT4904, or already enrolled in this course; and Not for BSc(Actuarial Science) students. BSC(Actuarial Science) students are advised to take STAT4904 Statistical learning for risk modelling instead.	Y	Y	1	No exam		Dr A J Zhang, Statistics & Actuarial Science	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013)	BSc in Actuarial Science (2017,2016,2015,2014, 2013); Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013);	
STAT3613	Marketing analytics	6	Pass in BIOL2102 or (ECON1280 and any University level 2 course) or (STAT1601 and any University level 2 course) or (STAT1602 and any University level 2 course) or STAT2601 or (STAT1603 and any University level 2 course) or STAT2901	Y	Y	1	Dec	50	Dr C W Kwan, Statistics & Actuarial Science		Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics	

											(2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3614	Business forecasting	6	Pass in BIOL2102 or (ECON1280 and any University level 2 course) or (STAT1601 and any University level 2 course) or (STAT1602 and any University level 2 course) or (STAT1603 and any University level 2 course); and Not for students who have passed or already enrolled in any of these courses; STAT2601, STAT2901, STAT3907, STAT4601, ECON2280.	N	N				Dr R W L Wong, Statistics & Actuarial Science		Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3615	Practical mathematics for investment	6	Pass in (STAT1601 and any University level 2 course) or (STAT1602 and any University level 2 course) or STAT2601 or (STAT1603 and any University level 2 course) or STAT2901; and Not for students who have passed in STAT2902, or have already enrolled in this course.	Y	>	2	May	-	Dr A G Benchimol, Statistics & Actuarial Science	Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Actuarial Studies (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3616	Advanced SAS programming	6	Pass in STAT2601 or STAT2901 (Students are strongly recommended to take STAT2603 or STAT2604 prior to taking this course.)	N	Z	1		50	TBC, Statistics & Actuarial Science		BSc in Actuarial Science (2017, 2016, 2015, 2014, 2013): Major in Decision Analytics (2017, 2016, 2015, 2014, 2013): Major in Statistics (2017, 2016, 2015, 2014, 2013): Minor in Statistics (2017, 2016, 2015, 2014, 2013): Minor in	
STAT3617	Sample survey methods	6	Pass or already enrolled in BIOL2102, or (ECON1280 and any University level 2 course), or (STAT1601 and any University level 2 course), or (STAT1602 and any University level 2 course), or STAT2601, or (STAT1603 and any University level 2 course), or STAT2901.	Y	Y	2	May		Ms O T K Choi, Statistics & Actuarial Science		Major in Food & Nutritional Science (2020,2019); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3618	Derivatives and risk management	6	Pass in STAT3615; and Not for students who have passed in STAT3910, or have already enrolled in this course; and Not for students who have passed in STAT3905, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for Bsc(Actuarial Science) students.	Y	Y	1	Dec	-	Dr R W L Wong, Statistics & Actuarial Science		Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3620	Modern nonparametric statistics	6	Pass in STAT2602 or STAT3902	Y	Y	1	Dec		Dr W T Li, Statistics & Actuarial Science		Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3621	Statistical data analysis	6	Pass in STAT3600 or STAT3907	Y	Υ	2	May	50	Dr D Y Zhang,		Major in Decision	

			(Students are strongly recommended to take STAT2603 or STAT2604 prior to taking this course.)						Statistics & Actuarial Science		Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3622	Data visualization	6	Pass in STAT2602 or STAT3902	Y	N	2	No exam	50	Prof G Yin, Statistics & Actuarial Science		Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3655	Survival analysis	6	Pass in STAT3902, or already enrolled in this course; or Pass in STAT3600 or STAT3901; and Not for students who have passed in STAT3955, or already enrolled in this course.	N	N				Dr J F Xu, Statistics & Actuarial Science		Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3799	Directed studies in statistics	6	Pass in at least 24 credits of advanced level disciplinary core/elective courses in the Decision Analytics/Risk Management/Statistics Majors; and Not for students who have already enrolled in STAT4799 in this academic year. This capstone course is only for students majoring in Decision Analytics/Risk Management/Statistics; and subject to the consent of course coordinator. This course is mutually exclusive with STAT4710. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2	No exam	50	Prof S M S Lee, Statistics & Actuarial Science			Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)
STAT3901	Life contingencies I	6	(Pass in STAT2602 and STAT3615) or (Pass in STAT2902 and (Pass in STAT3902 or already enrolled in this course)) or (Pass in STAT2602 and STAT2902)	Y	Y	1	Dec		Prof K C Yuen, Statistics & Actuarial Science	BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Actuarial Studies (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3902	Statistical models	6	Pass in STAT2901; and Not for students who have passed in STAT2602, or already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	1	Dec		Dr J F Xu, Statistics & Actuarial Science	BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
STAT3903	Stochastic models	6	Pass in STAT2901; and Not for students who have passed in MATH3603, or have already enrolled in this course; and Not for students who have passed in STAT3603, or have already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	2	May		Prof J J F Yao, Statistics & Actuarial Science	BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
STAT3904	Corporate finance for actuarial science	6	[(Pass in ACCT1101 and STAT2902) or (Pass in STAT3610 and STAT3615)]; and Not for students who have passed in	Y	Y	2	Мау		Dr D Lee, Statistics & Actuarial Science	BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Actuarial Studies (2020,2019,2018,2017, 2016,2015,2014,2013)	

			FINA1310, or have already enrolled in this course.									
STAT3905	Introduction to financial derivatives	6	Pass in STAT2902; and Not for students who have passed in STAT3618, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	1	Dec		Dr K C Cheung, Statistics & Actuarial Science	BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
STAT3906	Risk theory I	6	Pass in STAT3903, or already enrolled in this course; or Pass in MATH3603 or STAT3603	Y	Y	1	Dec	-	Dr K C Cheung, Statistics & Actuarial Science	BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Actuarial Studies (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3907	Linear models and forecasting	6	Pass in STAT2602 or STAT3902, or already enrolled in this course; and Not for students who have passed in STAT3600, or have already enrolled in this course; and Not for students who have passed in STAT4601, or have already enrolled in this course; and Not for students who have passed in STAT4601, or have already enrolled in this course; and Not for students who have passed in ECON2280, or have already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	2	May	-	Dr G Li, Statistics & Actuarial Science	BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
STAT3908	Credibility theory and loss distributions	6	Pass in STAT2602 or STAT3902 or STAT3906	Y	Y	2	May		Dr A G Benchimol, Statistics & Actuarial Science	BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Actuarial Studies (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3909	Life contingencies II	6	Pass in STAT3901, or already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	2	May		Dr D Lee, Statistics & Actuarial Science	BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)		
STAT3910	Financial economics I	6	Pass in STAT2602 or STAT3902; and Not for students who have passed in STAT3618, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course.	Y	Y	1	Dec		Prof H L Yang, Statistics & Actuarial Science	BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)	Minor in Actuarial Studies (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3911	Financial economics II	6	Pass in MATH3603 or STAT3603 or STAT3903 or STAT3910	Y	Y	2	May		Prof H L Yang, Statistics & Actuarial Science	BSc in Actuarial Science (2017,2016,2015,2014, 2013)	BSc in Actuarial Science (2020,2019,2018); Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Actuarial Studies (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3951	Further topics in contingencies	6	Pass in STAT3909; and Pass in STAT3910, or already enrolled in this course; and For BSc(Actuarial Science) students only.	N	Y				Dr D Lee, Statistics & Actuarial Science		BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3952	Investment and asset management	6	Pass in STAT3901; and Not for students who have passed in FINA2320, or have already enrolled in this course; and For BSc(Actuarial Science) students	N	N				TBC, Statistics & Actuarial Science			

			only.									1
STAT3953	Fundamentals of actuarial practice	6	Pass in STAT3901.	Y	Y	1	No exam		Dr A G Benchimol, Statistics & Actuarial Science		BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Actuarial Studies (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3954	Current topics in actuarial science	6	Pass in STAT3901, or already enrolled in this course; or Pass in STAT3909, or already enrolled in this course; and For BSc(Actuarial Science) students only.	N	N				TBC, Statistics & Actuarial Science		BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT3955	Survival analysis	6	Pass in STAT3902, or already enrolled in this course; or Pass in STAT3600 or STAT3901; Not for students who have passed in STAT3955, or already enrolled in this course.	N	N				Dr J F Xu, Statistics & Actuarial Science		Bachelor of Arts and Sciences in Applied Artificial Intelligence (2019); BSc in Actuarial Science (2019, 2018, 2017, 2016, 2015, 2014, 2013); Major in Statistics (2019, 2018, 2017, 2016, 2015, 2014, 2013); Minor in Statistics (2019, 2018, 2017, 2016, 2019, 2018, 2017, 2016, 2015, 2014, 2013)	
STAT3956	Pension funds and pension mathematics	6	Pass in STAT3909; and For BSc(Actuarial Science) students only.	N	Y				Prof G Ma, Statistics & Actuarial Science		BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT4601	Time-series analysis	6	Pass in STAT3600; and Not for students who have passed in STAT3614, or have already enrolled in this course; and Not for students who have passed in STAT3907, or have already enrolled in this course.	Y	Y	2	May		Dr G Li, Statistics & Actuarial Science	Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT4602	Multivariate data analysis	6	Pass in STAT3600 or STAT3907	Y	Y	2	May	50	Prof T W K Fung, Statistics & Actuarial Science	Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019); BSc in Actuarial Science (2017,2016,2015,2014, 2013); Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT4603	Current topics in risk management	6	Pass in (STAT3618 or FINA2322)	Y	Y	1	Dec		Dr O T K Choi, Statistics & Actuarial Science		Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Risk Management	

			1	[1	1			I	(2020,2019,2018,2017,	1
STAT4606	Risk management and Basel Accords in banking and finance	6	Pass in STAT3618 or STAT3910 or STAT3905 or (FINA2322 and any University level 3 course)	N	N				Mr P K Y Pang, Statistics & Actuarial Science		2016,2015,2014,2013) Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT4607	Credit risk analysis	6	Pass in STAT3618 or STAT3905 or STAT3910 or (FINA2322 and any University level 3 course)	Y	Y	2	May		Dr K P Wat, Statistics & Actuarial Science		BSc in Actuarial Science (2019,2018,2017,2016, 2015,2014,2013); Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT4608	Market risk analysis	6	Pass in STAT3907 and STAT3910; or Pass in STAT4601 and (FINA2320 or STAT3609)	Y	Y	2	May		Dr K Zhu, Statistics & Actuarial Science		BSc in Actuarial Science (2019,2018,2017,2016, 2015,2014,2013); Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT4609	Big data analytics	6	Pass in STAT3612 or STAT4904	Y	Y	2	No exam	50	Dr M Zhang, Statistics & Actuarial Science	Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013)		
STAT4610	Bayesian learning	6		N	Y				, Statistics & Actuarial Science		Bachelor of Arts and Sciences in Applied Artificial Intelligence (2020,2019)	
STAT4710	Capstone experience for statistics undergraduates	6	Students are expected to have satisfactorily completed at least 24 credits of advanced level disciplinary core/elective courses in the Decision Analytics/Risk Management/Statistics Majors. Students who are interested in taking the course should submit their applications to the Department. This capstone course is only for students majoring in Decision Analytics/Risk Management/Statistics, and is mutually exclusive with STAT3799, STAT4766 and STAT4799. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2	No exam	50	Prof G Yin, Statistics & Actuarial Science			Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)
STAT4711	Capstone experience for actuarial science undergraduates	6	Pass in at least 24 credits of advanced level disciplinary core/elective courses in BSc(Actuarial Science) programme including (Pass in STAT3901, or already enrolled in this course; or Pass in STAT3909, or already enrolled in this course); and	Y	Y	1, 2	No exam	50	Prof G Yin, Statistics & Actuarial Science			BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)

			This capstone course is only for BSc (Actuarial Science) students, and is mutually exclusive with STAT4767 and STAT4798. The earliest that a student is allowed to take this capstone course is their year 3 study.								
STAT4766	Statistics internship	6	Pass in at least 24 credits of advanced level disciplinary core/elective courses in the Decision Analytics/Risk Management/Statistics Majors. This capstone course is only for students majoring in Decision Analytics/Risk Management/Statistics; and is mutually exclusive with STAT4710. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2, S	No exam	l	Dr C W Kwan, Statistics & Actuarial Science		Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)
STAT4767	Actuarial science internship	6	Pass in at least 24 credits of advanced level disciplinary core/elective courses in BSc(Actuarial Science) programme including STAT3901; and This capstone course is only for BSc (Actuarial Science) students; and is mutually exclusive with STAT4711. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2	No exam		Dr A G Benchimol, Statistics & Actuarial Science		BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)
STAT4798	Statistics and actuarial science project	6	Pass in at least 24 credits of advanced level disciplinary core/elective courses in BSc(Actuarial Science) programme including STAT3902 and STAT3907; and Pass or already enrolled in at least one of the following courses: STAT3911, STAT4602, STAT4904; and This capstone course is only for BSc (Actuarial Science) students; and subject to the consent of course coordinator. This course is mutually exclusive with STAT4711. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	1, 2	No exam	50	Prof S M S Lee, Statistics & Actuarial Science		BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)
STAT4799	Statistics project	12	Pass in at least 24 credits of advanced level disciplinary core/elective courses in the Decision Analytics/Risk Management/Statistics Majors including STAT3600; and Pass or already enrolled in at least one of the following courses: STAT3612, STAT3911, STAT4601, STAT4602; and Not for students who have already enrolled in STAT3799 in this academic year. This capstone course is only for students majoring in Decision Analytics/Risk Management/Statistics; and subject to the consent of course coordinator. This course is mutually exclusive with STAT4710. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	0	No exam	50	Prof S M S Lee, Statistics & Actuarial Science		Major in Decision Analytics (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Risk Management (2020,2019,2018,2017, 2016,2015,2014,2013); Major in Statistics (2020,2019,2018,2017, 2016,2015,2014,2013)

STAT4901	Risk theory II	6	Pass in STAT3906	N	N				TBC, Statistics & Actuarial Science		BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT4902	Selected topics in actuarial science	6	Pass in STAT3906	N	Y				Dr J T Y Wong, Statistics & Actuarial Science		BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT4903	Actuarial techniques for general insurance	6	Pass in STAT3906	Y	Y	1	Dec		Dr A G Benchimol, Statistics & Actuarial Science		BSc in Actuarial Science (2020,2019,2018,2017, 2016,2015,2014,2013); Minor in Actuarial Studies (2020,2019,2018,2017, 2016,2015,2014,2013)	
STAT4904	Statistical learning for risk modelling	6	Pass in STAT3907 or STAT3600; and Not for students who have passed in STAT3612, or already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	2	Мау		Dr C Wang, Statistics & Actuarial Science	BSc in Actuarial Science (2020,2019,2018)	BSc in Actuarial Science (2017,2016,2015,2014, 2013)	
STAT7609	Research methods in statistics	6	Pass in STAT3600 or STAT3907	Y	Y	1	Dec		Prof J J F Yao, Statistics & Actuarial Science			
STAT7610	Advanced probability	6	Pass in STAT3603 or STAT3903	Y	Y	1	Dec		Prof H L Yang, Statistics & Actuarial Science			
STAT7611	Computational statistics	6	Pass in STAT3600 or STAT3907	Y	Υ	1	Dec		Prof G Yin, Statistics & Actuarial Science			
STAT7614	Advanced statistical modelling	6	Pass in STAT3600 or STAT3907	Y	Y	1, 2	Dec, May		Dr Y K Chung, Statistics & Actuarial Science			
STAT7615	Advanced quantitative risk management and finance	6	Pass in STAT4608	Y	Υ	2	May		Dr Z Zhang, Statistics & Actuarial Science			
Common Cor	e Courses	•	•	•		•		•		•	•	
CCCH9052	Arts, Science and Artifacts in Chinese Cultural Heritage	6	NIL	Y	Υ	1	No exam	120	Prof Q A Parker, Physics			
CCGL9016	Feeding the World	6	NIL	Υ	Υ	1	No exam	120	Dr G V Akom, Faculty			
CCGL9017	Food: Technology, Trade and Culture	6	NIL	Y	Υ	1	Dec	120	Dr T Sobko, Biological Sciences			
CCGL9033	Weapons of Mass Destruction: Science, Proliferation and Terrorism	6	NIL	Y	Υ	2	No exam	120	Dr K H Lemke, Earth Sciences			
CCST9012	Our Place in the Universe	6	NIL	Υ	Y	2	May	120	Dr T D Wotherspoon, Faculty			
CCST9013	Our Living Environment	6	NIL	Y	Y	2	No exam	120	Dr S C Chang, Earth Sciences			
CCST9014	Science and Music	6	NIL	Υ	Υ	2	No exam	120	Prof H F Chau, Physics			
CCST9017	Hidden Order in Daily Life: A Mathematical Perspective	6	NIL	Y	Υ	1	No exam	120	Prof T W Ng, Mathematics			
CCST9018	Origin and Evolution of Life	6	NIL	Y	Υ	2	No exam	120	Dr K H Lemke, Earth Sciences			
CCST9019	Understanding Climate Change	6	NIL	Y	Υ	2	No exam	120	Dr Z H Liu, Earth Sciences			
CCST9021	Hong Kong: Our Marine Heritage	6	NIL	Υ	Υ	2	No exam	120	Dr G V Akom, Faculty			
CCST9022	How the Mass Media Depicts	6	NIL	Υ	Υ	1	No exam	120	Prof H F Chau,			

	Science, Technology and the Natural World								Physics
CCST9023	The Oceans: Science and Society	6	NIL	Y	Υ	1	No exam	120	Dr J A King, Earth Sciences
CCST9026	Scientific Revolutions: Their Continuing Impact on Our World and Society	6	NIL	Y	Y	1	No exam	120	D Prof Q A Parker, Physics
CCST9030	Forensic Science: Unmasking Evidence, Mysteries and Crimes	6	NIL	Y	Y	1	No exam	120	Dr K K W Mak, Faculty
CCST9037	Mathematics: A Cultural Heritage	6	NIL	Y	Y	1	No exam	120	Dr B R Kane, Mathematics
CCST9038	Science and Science Fiction	6	NIL	Y	Y	2	No exam	120	D Prof A B Djurisic, Physics
CCST9043	Time's Arrow	6	NIL	Y	Y	2	May	120	D Dr Y L Li, Earth Sciences
CCST9045	The Science and Lore of Culinary Culture	6	NIL	Y	Y	2	No exam	120	D Dr A M Y Yuen, Chemistry
CCST9048	Simplifying Complexity	6	NIL	Y	Y	1	No exam	120	D Dr T D Wotherspoon, Faculty
CCST9051	What are We Made of - the Fundamental Nature of Matter	6	NIL	Y	Y	1	No exam	120	D Prof S Xu, Physics
CCST9054	War, Peace, and the Natural World	6	NIL	Y	Y	S	No exam	120	Dr D M Baker, Biological Sciences
CCST9056	The Force is with You: How Things Work	6	NIL	Y	Y	1	No exam	120	Dr F C C Ling, Physics
CCST9065	Women in Science	6	NIL	Y	Υ	2	No exam	120	D Prof A B Djurisic, Physics
CCST9067	Leaving Earth: Our Future in Space	6	NIL	Y	Y	2	May	120	Dr J R Michalski, Earth Sciences
CCST9068	Artificial Intelligence: Utopia or Dystopia?	6	NIL	Y	Y	2	No exam	120	D Dr R K W Lui, Faculty

Equivalency of HKDSE and

other qualifications

SCIENCE

SECTION V Equivalency of HKDSE and other qualifications

Table of Equivalence between HKDSE and Other Qualifications

HADGE	Con de		Equival	lent Qualification	to HKDSE	
HKDSE	Grade	IB	GCE	SATII	AP	Gao Kao (高考)
Biology	3 or above	Biology (SL/HL)	Biology (AL)	Biology	Biology	
Chemistry	3 or above	Chemistry (SL/HL)	Chemistry (AL)	Chemistry	Chemistry	
Physics	3 or above	Physics (SL/HL)	Physics (AL)	Physics	Physics B or C	Equivalent to
Mathematics	2 or above	Mathematics (SL)/Mathematical Studies (SL)	Mathematics (AL)	Mathematics Level 1 or 2		fulfillment of all HKDSE requirements
Mathematics + (M1 or M2)	2 or above	Mathematics (HL)/Mathematical Studies (HL)	Pure Mathematics (AL) Further Mathematics (AL)		Calculus AB or BC	

Note:

HL: Higher Level SL: Standard Level AL: Advanced Level

Remarks:

For science students admitted through non-JUPAS scheme, the equivalent subject qualification(s) to HKDSE, if possessed, can be identified by the SIS for on-line course selection.

For other non-science students admitted through non-JUPAS scheme, they are still required to obtain the written approval from the Course Selection Adviser of the course offering department/school even they have possessed the equivalent HKDSE subject qualification(s) to meet the course prerequisite requirement. Once approval is given, they need to forward it to their home faculties to add the course on-line.

Science Majors 2020-2021

SCIENCE

SECTION VI Science Majors on offer in 2020/2021

Majors offered by Science Faculty

Majors

Astronomy (only for 2017 cohort or before)

Biochemistry

Biological Sciences

Biological Sciences (Intensive) (for BSc students (2017 cohort and thereafter) only)

Chemistry

Chemistry (Intensive) (for BSc students (2015 cohort and thereafter) only)

Decision Analytics (not for BASc(AppliedAI) students)

Earth System Science

Ecology & Biodiversity

Ecology & Biodiversity (Intensive) (for BSc students (2015 cohort and thereafter) only)

Environmental Science

Food & Nutritional Science

Geology

Geology (Intensive) (for BSc students (2015 cohort and thereafter) only)

Mathematics

Mathematics (Intensive) (for BSc students (2016 cohort and thereafter) only)

Mathematics/Physics (only for 2017 cohort or before)

Molecular Biology & Biotechnology

Molecular Biology & Biotechnology (Intensive) (for BSc students (2015 cohort and thereafter) only)

Physics

Physics (Intensive) (for BSc students (2016 cohort and thereafter) only)

Risk Management

Statistics

Offered to students 2017

admitted to Year 1 in

Objectives:

The 21st century is the golden age for astronomy as space-based telescopes are being used to explore the Universe in all parts of the electromagnetic spectrum, including X-ray, ultraviolet, and infrared. The Major in Astronomy is intended for the students who would like to acquire a solid foundation on the subject. A large selection of elective courses is provided for students to pursue their interested specialization in the subject, including observational astronomy, planetary science, stellar physics, and interstellar medium. Students will attain professional knowledge in astronomy, research experience and the training of analytical thinking and quantitative reasoning during their studies. In addition to preparing students for postgraduate studies as professional astronomers, astronomy training can lead to local careers in museums, weather services, and the education sectors. Beyond Hong Kong, astronomy graduates have challenging careers in aerospace, communications, energy, and computer industries, as well as in astronomical observatories and space research centers.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and frequent opportunities in field activities in the curriculum)
- PLO 3: analyze astrophysical problems qualitatively and quantitatively, and recognize moral and ethical issues related to the discipline (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-world setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Minor in Astronomy

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

PHYS1250 Fundamental physics (6)
PHYS1650 Nature of the universe (6)
EASC2408 Planetary geology (6)
PHYS2250 Introductory mechanics (6)
PHYS2265 Introductory quantum physics (6)

Disciplinary Electives (6 Credits)

At least 6 credits selected from the following courses:

PHYS1150 Problem solving in physics (6)

PHYS2055 Introductory relativity (6)

PHYS2150 Methods in physics I (6)

PHYS2155 Methods in physics II (6)

PHYS2255 Introductory electricity and magnetism (6)

PHYS2260 Heat and waves (6)

2. Advanced level courses (42 credits) Disciplinary Core Courses (18 credits)

PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)

Disciplinary Electives (24 credits)

At least 12 credits selected from courses in List A:

List A

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)
PHYS4653 Cosmology (6)
PHYS4655 Interstellar medium (6)
PHYS7650 Stellar atmospheres (6)

Plus at least 12 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current course list includes courses in List B and those courses not selected to fulfill the requirements in List A and the capstone requirement.

List B

PHYS3150 Theoretical physics (6)
PHYS3151 Machine learning in physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)

II		li de la companya de la companya de la companya de la companya de la companya de la companya de la companya de
PHYS3450	Electromagnetism (6)	
PHYS3550	Statistical mechanics & thermodynamics (6)	
PHYS3551	Introductory solid state physics (6)	
PHYS3653	Astrophysics (6)	
PHYS3660	Astronomy laboratory (6)	
PHYS3750	Laser and spectroscopy (6)	
PHYS3751	Physics of nanomaterials (6)	
PHYS3760	Physics laboratory (6)	
PHYS3850	Physical Optics (6)	[previous title: Waves and optics (6)]
PHYS3851	Atomic and nuclear physics (6)	, , , -
PHYS4150	Computational physics (6)	
PHYS4151	Data analysis and modeling in physics (6)	
PHYS4350	Advanced classical mechanics (6)	
PHYS4351	Advanced quantum mechanics (6)	
PHYS4450	Advanced electromagnetism (6)	
PHYS4550	Advanced statistical mechanics (6)	
PHYS4551	Solid state physics (6)	
PHYS4654	General relativity (6)	
PHYS4656	Advanced astrophysics (6)	
PHYS4750	Experimental physics (6)	
PHYS4850	Particle physics (6)	
PHYS7350	Graduate classical mechanics (6)	
PHYS7351	Graduate quantum mechanics (6)	
PHYS7450	Graduate electromagnetism (6)	
PHYS7550	Graduate statistical mechanics (6)	
PHYS7551	Graduate solid state physics (6)	
PHYS7750	Nanophysics (6)	
3. Capstone requirement	t (6 credits)	
At least 6 credits select	ed from the following courses:	
PHYS3999	Directed studies in physics (6)	
PHYS4966	Physics internship (6)	
PHYS4999	Physics project (12)	

Notes:

- 1. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 6. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240.

Remarks:

Offered to students 2016

admitted to Year 1 in

Objectives:

The 21st century is the golden age for astronomy as space-based telescopes are being used to explore the Universe in all parts of the electromagnetic spectrum, including X-ray, ultraviolet, and infrared. The Major in Astronomy is intended for the students who would like to acquire a solid foundation on the subject. A large selection of elective courses is provided for students to pursue their interested specialization in the subject, including observational astronomy, planetary science, stellar physics, and interstellar medium. Students will attain professional knowledge in astronomy, research experience and the training of analytical thinking and quantitative reasoning during their studies. In addition to preparing students for postgraduate studies as professional astronomers, astronomy training can lead to local careers in museums, weather services, and the education sectors. Beyond Hong Kong, astronomy graduates have challenging careers in aerospace, communications, energy, and computer industries, as well as in astronomical observatories and space research centers.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and frequent opportunities in field activities in the curriculum)
- PLO 3: analyze astrophysical problems qualitatively and quantitatively, and recognize moral and ethical issues related to the discipline (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-world setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Minor in Astronomy

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

PHYS1250 Fundamental physics (6)
PHYS1650 Nature of the universe (6)
EASC2408 Planetary geology (6)
PHYS2250 Introductory mechanics (6)
PHYS2265 Introductory quantum physics (6)

Disciplinary Elective (6 credits)

At least 6 credits selected from the following courses:

PHYS1150 Problem solving in physics (6)

PHYS2055 Introductory relativity (6)

PHYS2150 Methods in physics I (6)

PHYS2155 Methods in physics II (6)

PHYS2255 Introductory electricity and magnetism (6)

PHYS2260 Heat and waves (6)

2. Advanced level courses (42 credits) Disciplinary Core Courses (18 credits)

PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)

Disciplinary Electives (24 credits)

At least 12 credits selected from courses in List A:

List A

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)
PHYS4653 Cosmology (6)
PHYS4655 Interstellar medium (6)
PHYS7650 Stellar atmospheres (6)

Plus at least 12 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current course list includes courses in List B and those courses not selected to fulfill the requirements in List A and the capstone requirement.

List B

PHYS3150 Theoretical physics (6)
PHYS3151 Machine learning in physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)

PHYS3450	Electromagnetism (6)	
PHYS3550	Statistical mechanics & thermodynamics (6)	
PHYS3551	Introductory solid state physics (6)	
PHYS3653	Astrophysics (6)	
PHYS3660	Astronomy laboratory (6)	
PHYS3750	Laser and spectroscopy (6)	
PHYS3751	Physics of nanomaterials (6)	
PHYS3760	Physics laboratory (6)	
PHYS3850	Physical Optics (6)	[previous title: Waves and optics (6)]
PHYS3851	Atomic and nuclear physics (6)	(-7.2
PHYS4150	Computational physics (6)	
PHYS4151	Data analysis and modeling in physics (6)	
PHYS4350	Advanced classical mechanics (6)	
PHYS4351	Advanced quantum mechanics (6)	
PHYS4450	Advanced electromagnetism (6)	
PHYS4550	Advanced statistical mechanics (6)	
PHYS4551	Solid state physics (6)	
PHYS4654	General relativity (6)	
PHYS4656	Advanced astrophysics (6)	
PHYS4750	Experimental physics (6)	
PHYS4850	Particle physics (6)	
PHYS7350	Graduate classical mechanics (6)	
PHYS7351	Graduate quantum mechanics (6)	
PHYS7450	Graduate electromagnetism (6)	
PHYS7550	Graduate statistical mechanics (6)	
PHYS7551	Graduate solid state physics (6)	
PHYS7750	Nanophysics (6)	
3. Capstone requireme	,	
	cted from the following courses:	
PHYS3999	Directed studies in physics (6)	
PHYS4966	Physics internship (6)	
PHYS4999	Physics project (12)	

Notes:

- 1. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 6. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240.

Remarks:

Offered to students 2015

admitted to Year 1 in

Objectives:

The 21st century is the golden age for astronomy as space-based telescopes are being used to explore the Universe in all parts of the electromagnetic spectrum, including X-ray, ultraviolet, and infrared. The Major in Astronomy is intended for the students who would like to acquire a solid foundation on the subject. A large selection of elective courses is provided for students to pursue their interested specialization in the subject, including observational astronomy, planetary science, stellar physics, and interstellar medium. Students will attain professional knowledge in astronomy, research experience and the training of analytical thinking and quantitative reasoning during their studies. In addition to preparing students for postgraduate studies as professional astronomers, astronomy training can lead to local careers in museums, weather services, and the education sectors. Beyond Hong Kong, astronomy graduates have challenging careers in aerospace, communications, energy, and computer industries, as well as in astronomical observatories and space research centers.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and frequent opportunities in field activities in the curriculum)
- PLO 3: analyze astrophysical problems qualitatively and quantitatively, and recognize moral and ethical issues related to the discipline (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-world setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Minor in Astronomy

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

PHYS1250 Fundamental physics (6)
PHYS1650 Nature of the universe (6)
EASC2408 Planetary geology (6)
PHYS2250 Introductory mechanics (6)
PHYS2265 Introductory quantum physics (6)

Disciplinary Electives (6 credits)

At least 6 credits selected from the following courses:
PHYS1150 Problem solving in physics (6)
PHYS2055 Introductory relativity (6)
PHYS2150 Methods in physics I (6)
PHYS2155 Methods in physics II (6)

PHYS2255 Introductory electricity and magnetism (6)

PHYS2260 Heat and waves (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (18 credits)

PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)

Disciplinary Electives (24 credits)

At least 12 credits selected from courses in List A:

List A

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)
PHYS4653 Cosmology (6)
PHYS4655 Interstellar medium (6)
PHYS7650 Stellar atmospheres (6)

Plus at least 12 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current course list includes courses in List B and those courses not selected to fulfill the requirements in List A and the capstone requirement.

List B

PHYS3150 Theoretical physics (6)
PHYS3151 Machine learning in physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)

PHYS3450	Electromagnetism (6)	
PHYS3550	Statistical mechanics & thermodynamics (6)	
PHYS3551	Introductory solid state physics (6)	
PHYS3653	Astrophysics (6)	
PHYS3660	Astronomy laboratory (6)	
PHYS3750	Laser and spectroscopy (6)	
PHYS3751	Physics of nanomaterials (6)	
PHYS3760	Physics laboratory (6)	
PHYS3850	Physical Optics (6)	[previous title: Waves and optics
11110000	, c. ca c p. 100 (0)	(6)]
PHYS3851	Atomic and nuclear physics (6)	(/ /
PHYS4150	Computational physics (6)	
PHYS4151	Data analysis and modeling in physics (6)	
PHYS4350	Advanced classical mechanics (6)	
PHYS4351	Advanced quantum mechanics (6)	
PHYS4450	Advanced electromagnetism (6)	
PHYS4550	Advanced statistical mechanics (6)	
PHYS4551	Solid state physics (6)	
PHYS4654	General relativity (6)	
PHYS4656	Advanced astrophysics (6)	
PHYS4750	Experimental physics (6)	
PHYS4850	Particle physics (6)	
PHYS7350	Graduate classical mechanics (6)	
PHYS7351	Graduate quantum mechanics (6)	
PHYS7450	Graduate electromagnetism (6)	
PHYS7550	Graduate statistical mechanics (6)	
PHYS7551	Graduate solid state physics (6)	
PHYS7750	Nanophysics (6)	
3. Capstone requirement	,	
At least 6 credits selected from the following courses:		
PHYS3999	Directed studies in physics (6)	
PHYS4966	Physics internship (6)	
PHYS4999	Physics project (12)	

Notes:

- 1. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 6. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240.

Remarks:

Offered to students 2014

admitted to Year 1 in

Objectives:

The 21st century is the golden age for astronomy as space-based telescopes are being used to explore the Universe in all parts of the electromagnetic spectrum, including X-ray, ultraviolet, and infrared. The Major in Astronomy is intended for the students who would like to acquire a solid foundation on the subject. A large selection of elective courses is provided for students to pursue their interested specialization in the subject, including observational astronomy, planetary science, stellar physics, and interstellar medium. Students will attain professional knowledge in astronomy, research experience and the training of analytical thinking and quantitative reasoning during their studies. In addition to preparing students for postgraduate studies as professional astronomers, astronomy training can lead to local careers in museums, weather services, and the education sectors. Beyond Hong Kong, astronomy graduates have challenging careers in aerospace, communications, energy, and computer industries, as well as in astronomical observatories and space research centers.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and frequent opportunities in field activities in the curriculum)
- PLO 3: analyze astrophysical problems qualitatively and quantitatively, and recognize moral and ethical issues related to the discipline (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-world setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Minor in Astronomy

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

PHYS1250 Fundamental physics (6)
PHYS1650 Nature of the universe (6)
EASC2408 Planetary geology (6)
PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)

PHYS2265 Introductory quantum physics (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (18 credits)

PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)

Disciplinary Electives (24 credits)

At least 12 credits selected from courses in List A:

List A

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)
PHYS4653 Cosmology (6)
PHYS4655 Interstellar medium (6)
PHYS7650 Stellar atmospheres (6)

Plus at least 12 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current course list includes courses in List B and those courses not selected to fulfill the requirements in List A and the capstone requirement.

List B

PHYS3150 Theoretical physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3551 Introductory solid state physics (6)
PHYS3750 Laser and spectroscopy (6)
PHYS3751 Physics of nanomaterials (6)

PHYS3850 Physical Optics (6) [previous title: Waves and optics (6)]

PHYS3851 Atomic and nuclear physics (6) PHYS4150 Computational physics (6)

PHYS4151	Data analysis and modeling in physics (6)		
PHYS4350	Advanced classical mechanics (6)		
PHYS4351	Advanced quantum mechanics (6)		
PHYS4450	Advanced electromagnetism (6)		
PHYS4550	Advanced statistical mechanics (6)		
PHYS4551	Solid state physics (6)		
PHYS4654	General relativity (6)		
PHYS4750	Experimental physics (6)		
PHYS4850	Particle physics (6)		
PHYS7350	Graduate classical mechanics (6)		
PHYS7351	Graduate quantum mechanics (6)		
PHYS7450	Graduate electromagnetism (6)		
PHYS7550	Graduate statistical mechanics (6)		
PHYS7551	Graduate solid state physics (6)		
PHYS7750	Nanophysics (6)		
3 Canstone requirement (6 credits)			

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
PHYS3999 Directed studies in physics (6)
PHYS4966 Physics internship (6)
PHYS4999 Physics project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240.

Remarks:

Offered to students 2013

admitted to Year 1 in

Objectives:

The 21st century is the golden age for astronomy as space-based telescopes are being used to explore the Universe in all parts of the electromagnetic spectrum, including X-ray, ultraviolet, and infrared. The Major in Astronomy is intended for the students who would like to acquire a solid foundation on the subject. A large selection of elective courses is provided for students to pursue their interested specialization in the subject, including observational astronomy, planetary science, stellar physics, and interstellar medium. Students will attain professional knowledge in astronomy, research experience and the training of analytical thinking and quantitative reasoning during their studies. In addition to preparing students for postgraduate studies as professional astronomers, astronomy training can lead to local careers in museums, weather services, and the education sectors. Beyond Hong Kong, astronomy graduates have challenging careers in aerospace, communications, energy, and computer industries, as well as in astronomical observatories and space research centers.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and frequent opportunities in field activities in the curriculum)
- PLO 3: analyze astrophysical problems qualitatively and quantitatively, and recognize moral and ethical issues related to the discipline (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-world setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Minor in Astronomy

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

PHYS1250 Fundamental physics (6)
PHYS1650 Nature of the universe (6)
EASC2408 Planetary geology (6)
PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)

PHYS2265 Introductory quantum physics (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (18 credits)

PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)

Disciplinary Electives (24 credits)

At least 12 credits selected from courses in List A:

List A

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)
PHYS4653 Cosmology (6)
PHYS4655 Interstellar medium (6)
PHYS7650 Stellar atmospheres (6)

Plus at least 12 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current course list includes courses in List B and those courses not selected to fulfill the requirements in List A and the capstone requirement.

List B

PHYS3150 Theoretical physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3551 Introductory solid state physics (6)
PHYS3750 Laser and spectroscopy (6)
PHYS3751 Physics of nanomaterials (6)

PHYS3850 Physical Optics (6) [previous title: Waves and optics (6)]

PHYS3851 Atomic and nuclear physics (6)
PHYS4150 Computational physics (6)

PHYS4151	Data analysis and modeling in physics (6)	
PHYS4350	Advanced classical mechanics (6)	
PHYS4351	Advanced quantum mechanics (6)	
PHYS4450	Advanced electromagnetism (6)	
PHYS4550	Advanced statistical mechanics (6)	
PHYS4551	Solid state physics (6)	
PHYS4654	General relativity (6)	
PHYS4750	Experimental physics (6)	
PHYS4850	Particle physics (6)	
PHYS7350	Graduate classical mechanics (6)	
PHYS7351	Graduate quantum mechanics (6)	
PHYS7450	Graduate electromagnetism (6)	
PHYS7550	Graduate statistical mechanics (6)	
PHYS7551	Graduate solid state physics (6)	
PHYS7750	Nanophysics (6)	
2 Canatana raquirament (6 aradita)		

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
PHYS3999 Directed studies in physics (6)
PHYS4966 Physics internship (6)
PHYS4999 Physics project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240.

Remarks:

Major Title Major in Astronomy

Offered to students 2012

admitted to Year 1 in

Objectives:

The 21st century is the golden age for astronomy as space-based telescopes are being used to explore the Universe in all parts of the electromagnetic spectrum, including X-ray, ultraviolet, and infrared. The Major in Astronomy is intended for the students who would like to acquire a solid foundation on the subject. A large selection of elective courses is provided for students to pursue their interested specialization in the subject, including observational astronomy, planetary science, stellar physics, and interstellar medium. Students will attain professional knowledge in astronomy, research experience and the training of analytical thinking and quantitative reasoning during their studies. In addition to preparing students for postgraduate studies as professional astronomers, astronomy training can lead to local careers in museums, weather services, and the education sectors. Beyond Hong Kong, astronomy graduates have challenging careers in aerospace, communications, energy, and computer industries, as well as in astronomical observatories and space research centers.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and frequent opportunities in field activities in the curriculum)
- PLO 3: analyze astrophysical problems qualitatively and quantitatively, and recognize moral and ethical issues related to the discipline (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-world setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Minor in Astronomy

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

PHYS1250 Fundamental physics (6)
PHYS1650 Nature of the universe (6)
EASC2408 Planetary geology (6)
PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)

PHYS2265 Introductory quantum physics (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (18 credits)

PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)

Disciplinary Electives (24 credits)

At least 12 credits selected from courses in List A:

List A

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)
PHYS4653 Cosmology (6)
PHYS4655 Interstellar medium (6)
PHYS7650 Stellar atmospheres (6)

Plus at least 12 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current course list includes courses in List B and those courses not selected to fulfill the requirements in List A and the capstone requirement.

List B

PHYS3150 Theoretical physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3551 Introductory solid state physics (6)
PHYS3750 Laser and spectroscopy (6)
PHYS3751 Physics of nanomaterials (6)

PHYS3850 Physical Optics (6) [previous title: Waves and optics (6)]

PHYS3851 Atomic and nuclear physics (6) PHYS4150 Computational physics (6)

PHYS4151	Data analysis and modeling in physics (6)
PHYS4350	Advanced classical mechanics (6)
PHYS4351	Advanced quantum mechanics (6)
PHYS4450	Advanced electromagnetism (6)
PHYS4550	Advanced statistical mechanics (6)
PHYS4551	Solid state physics (6)
PHYS4654	General relativity (6)
PHYS4750	Experimental physics (6)
PHYS4850	Particle physics (6)
PHYS7350	Graduate classical mechanics (6)
PHYS7351	Graduate quantum mechanics (6)
PHYS7450	Graduate electromagnetism (6)
PHYS7550	Graduate statistical mechanics (6)
PHYS7551	Graduate solid state physics (6)
PHYS7750	Nanophysics (6)
3. Capstone requirement	(6 credits)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses: Directed studies in physics (6) PHYS3999 **PHYS4966** Physics internship (6) PHYS4999 Physics project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for
- 5. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240.

Remarks:

Offered to students 2020

admitted to Year 1 in

Objectives:

The Major in Biochemistry aims to provide students with both basic and advanced knowledge in contemporary biochemistry and molecular biology. Core courses in the curriculum emphasize equipping students with a general understanding of the fundamental ideas, principles and theories of biochemistry with particular focus on the relevance of biochemistry, molecular biology and genomics to biology, human health and disease. Elective courses extend this core knowledge to provide students with specialized insight into both basic and applied scientific endeavour in biochemistry, bioinformatics, molecular biology and molecular genetics. Throughout the curriculum there is an emphasis on experiential learning through laboratory practicals, problem-solving exercises, group-based learning, industrial experience, overseas exchange and research-based projects. These experiences are designed to develop students' ability to read and interpret scientific data, to integrate knowledge with wider scientific theory, and to improve logical thinking and communication skills. The ultimate goal is to provide a comprehensive degree-level biochemistry education that equips students with the critical thinking, communication and analytical skills essential for them to play a leading role in society in the future.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the principles of biomolecular structure, metabolism, molecular interactions, molecular processes and their regulation, genetics and systems biology critical to contemporary biochemistry and molecular biology (by means of coursework and experiential learning)
- PLO 2: apply biochemical, bioinformatics and molecular genetics technologies for new observations, measurements and analyses; and to design experiments that bring discovery and insight into the unknown (by means of laboratory-based and research project-based learning)
- PLO 3: interpret and communicate scientific data and literature using appropriate scientific language (by means of literature-based coursework and debate)
- PLO 4: work effectively as a team and synergize with their colleagues in a supportive manner (by means of group-based learning and by group-based problem solving)
- PLO 5: recognize the interconnections of biochemistry with other disciplines in science, medicine and engineering, humanities and ethics, which are relevant for diverse working environment in the society (by means of multidisciplinary-based research projects, internship and debate)

Impermissible Combinations:

Minor in Biochemistry

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

CHEM1042 General chemistry I (6)
CHEM1043 General chemistry II (6)
BIOC2600 Basic biochemistry (6)

BIOL2220 Principles of biochemistry (6)

CHEM2441 Organic chemistry I (6)

Disciplinary Electives (6 credits)

BIOC1600 Perspectives in biochemistry (6)

BIOL1110 From molecules to cells (6)

Take either BIOC1600 or BIOL1110 to fulfill this 6 credits requirement, but not both. Take either BIOC1600 or BIOL1110 to fulfill this 6 credits requirement, but not both.

Take either BIOC2600 or BIOL2220 to fulfill

Take either BIOC2600 or BIOL2220 to fulfill

this 24 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

this 24 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive

exclusive.

2. Advanced level courses (48 credits)

Disciplinary Core Courses (30 credits)

BIOC3601 Basic metabolism (6)

BIOC3604 Essential techniques in biochemistry and molecular biology (6)

Molecular biology (6)

BIOL3401 Molecular biology (6) BIOC4610 Advanced biochemistry (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOC3605 Sequence bioinformatics (6)
BIOC3606 Molecular medicine (6)
BIOL3202 Nutritional biochemistry (6)
BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3408 Genetics (6)

CHEM3441 Organic chemistry II (6)

BIOC4612 Molecular biology of the gene (6)

BIOL4417 'Omics' and systems biology (6)
CHEM4145 Medicinal chemistry (6)

CHEM4444 Chemical biology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
BIOC3999 Directed studies in biochemistry (6)
BIOC4966 Biochemistry internship (6)
BIOC4999 Biochemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.
- 5. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Offered to students 2019

admitted to Year 1 in

Objectives:

The Major in Biochemistry aims to provide students with both basic and advanced knowledge in contemporary biochemistry and molecular biology. Core courses in the curriculum emphasize equipping students with a general understanding of the fundamental ideas, principles and theories of biochemistry with particular focus on the relevance of biochemistry, molecular biology and genomics to biology, human health and disease. Elective courses extend this core knowledge to provide students with specialized insight into both basic and applied scientific endeavour in biochemistry, bioinformatics, molecular biology and molecular genetics. Throughout the curriculum there is an emphasis on experiential learning through laboratory practicals, problem-solving exercises, group-based learning, industrial experience, overseas exchange and research-based projects. These experiences are designed to develop students' ability to read and interpret scientific data, to integrate knowledge with wider scientific theory, and to improve logical thinking and communication skills. The ultimate goal is to provide a comprehensive degree-level biochemistry education that equips students with the critical thinking, communication and analytical skills essential for them to play a leading role in society in the future.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the principles of biomolecular structure, metabolism, molecular interactions, molecular processes and their regulation, genetics and systems biology critical to contemporary biochemistry and molecular biology (by means of coursework and experiential learning)
- PLO 2: apply biochemical, bioinformatics and molecular genetics technologies for new observations, measurements and analyses; and to design experiments that bring discovery and insight into the unknown (by means of laboratory-based and research project-based learning)
- PLO 3: interpret and communicate scientific data and literature using appropriate scientific language (by means of literature-based coursework and debate)
- PLO 4: work effectively as a team and synergize with their colleagues in a supportive manner (by means of group-based learning and by group-based problem solving)
- PLO 5: recognize the interconnections of biochemistry with other disciplines in science, medicine and engineering, humanities and ethics, which are relevant for diverse working environment in the society (by means of multidisciplinary-based research projects, internship and debate)

Impermissible Combinations:

Minor in Biochemistry

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

CHEM1042 General chemistry I (6)
CHEM1043 General chemistry II (6)
BIOC2600 Basic biochemistry (6)

BIOL2220 Principles of biochemistry (6)

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CHEM2441 Organic chemistry I (6)

Disciplinary Electives (6 credits)

BIOC1600 Perspectives in biochemistry (6)

BIOL1110 From molecules to cells (6)

Take either BIOC1600 or BIOL1110 to fulfill this 6 credits requirement, but not both. Take either BIOC1600 or BIOL1110 to fulfill this 6 credits requirement, but not both.

Take either BIOC2600 or BIOL2220 to fulfill

Take either BIOC2600 or BIOL2220 to fulfill

this 24 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

this 24 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive

exclusive.

2. Advanced level courses (48 credits)

Disciplinary Core Courses (30 credits)

BIOC3601 Basic metabolism (6)

BIOC3604 Essential techniques in biochemistry and molecular biology (6)

BIOL3401 Molecular biology (6) BIOC4610 Advanced biochemistry (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOC3605 Sequence bioinformatics (6)
BIOC3606 Molecular medicine (6)
BIOL3202 Nutritional biochemistry (6)
BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3408 Genetics (6)

CHEM3441 Organic chemistry II (6)

BIOC4612 Molecular biology of the gene (6)

BIOL4417 'Omics' and systems biology (6)
CHEM4145 Medicinal chemistry (6)
CHEM4444 Chemical biology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
BIOC3999 Directed studies in biochemistry (6)
BIOC4966 Biochemistry internship (6)
BIOC4999 Biochemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks

Offered to students 2018

admitted to Year 1 in

Objectives:

The Major in Biochemistry aims to provide students with both basic and advanced knowledge in contemporary biochemistry and molecular biology. Core courses in the curriculum emphasize equipping students with a general understanding of the fundamental ideas, principles and theories of biochemistry with particular focus on the relevance of biochemistry, molecular biology and genomics to biology, human health and disease. Elective courses extend this core knowledge to provide students with specialized insight into both basic and applied scientific endeavour in biochemistry, bioinformatics, molecular biology and molecular genetics. Throughout the curriculum there is an emphasis on experiential learning through laboratory practicals, problem-solving exercises, group-based learning, industrial experience, overseas exchange and research-based projects. These experiences are designed to develop students' ability to read and interpret scientific data, to integrate knowledge with wider scientific theory, and to improve logical thinking and communication skills. The ultimate goal is to provide a comprehensive degree-level biochemistry education that equips students with the critical thinking, communication and analytical skills essential for them to play a leading role in society in the future.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the principles of biomolecular structure, metabolism, molecular interactions, molecular processes and their regulation, genetics and systems biology critical to contemporary biochemistry and molecular biology (by means of coursework and experiential learning)
- PLO 2: apply biochemical, bioinformatics and molecular genetics technologies for new observations, measurements and analyses; and to design experiments that bring discovery and insight into the unknown (by means of laboratory-based and research project-based learning)
- PLO 3: interpret and communicate scientific data and literature using appropriate scientific language (by means of literature-based coursework and debate)
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- PLO 5: recognize the interconnections of biochemistry with other disciplines in science, medicine and engineering, humanities and ethics, which are relevant for diverse working environment in the society (by means of multidisciplinary-based research projects, internship and debate)

Impermissible Combinations:

Minor in Biochemistry

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

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CHEM1043 General chemistry II (6)
BIOC2600 Basic biochemistry (6)

BIOL2220 Principles of biochemistry (6)

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CHEM2441 Organic chemistry I (6)

Disciplinary Electives (6 credits)

BIOC1600 Perspectives in biochemistry (6)

BIOL1110 From molecules to cells (6)

Take either BIOC1600 or BIOL1110 to fulfill this 6 credits requirement, but not both. Take either BIOC1600 or BIOL1110 to fulfill this 6 credits requirement, but not both.

Take either BIOC2600 or BIOL2220 to fulfill

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this 24 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

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2. Advanced level courses (48 credits)

Disciplinary Core Courses (30 credits)

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BIOL3401 Molecular biology (6) BIOC4610 Advanced biochemistry (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

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BIOC3606 Molecular medicine (6)
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BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3408 Genetics (6)

CHEM3441 Organic chemistry II (6)

BIOC4612 Molecular biology of the gene (6)

BIOL4417 'Omics' and systems biology (6)
CHEM4145 Medicinal chemistry (6)
CHEM4444 Chemical biology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
BIOC3999 Directed studies in biochemistry (6)
BIOC4966 Biochemistry internship (6)
BIOC4999 Biochemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks

Offered to students 2017

admitted to Year 1 in

Objectives:

The Major in Biochemistry aims to provide students with both basic and advanced knowledge in contemporary biochemistry and molecular biology. Core courses in the curriculum emphasize equipping students with a general understanding of the fundamental ideas, principles and theories of biochemistry with particular focus on the relevance of biochemistry, molecular biology and genomics to biology, human health and disease. Elective courses extend this core knowledge to provide students with specialized insight into both basic and applied scientific endeavour in biochemistry, bioinformatics, molecular biology and molecular genetics. Throughout the curriculum there is an emphasis on experiential learning through laboratory practicals, problem-solving exercises, group-based learning, industrial experience, overseas exchange and research-based projects. These experiences are designed to develop students' ability to read and interpret scientific data, to integrate knowledge with wider scientific theory, and to improve logical thinking and communication skills. The ultimate goal is to provide a comprehensive degree-level biochemistry education that equips students with the critical thinking, communication and analytical skills essential for them to play a leading role in society in the future.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the principles of biomolecular structure, metabolism, molecular interactions, molecular processes and their regulation, genetics and systems biology critical to contemporary biochemistry and molecular biology (by means of coursework and experiential learning)
- PLO 2: apply biochemical, bioinformatics and molecular genetics technologies for new observations, measurements and analyses; and to design experiments that bring discovery and insight into the unknown (by means of laboratory-based and research project-based learning)
- PLO 3: interpret and communicate scientific data and literature using appropriate scientific language (by means of literature-based coursework and debate)
- PLO 4: work effectively as a team and synergize with their colleagues in a supportive manner (by means of group-based learning and by group-based problem solving)
- PLO 5: recognize the interconnections of biochemistry with other disciplines in science, medicine and engineering, humanities and ethics, which are relevant for diverse working environment in the society (by means of multidisciplinary-based research projects, internship and debate)

Impermissible Combinations:

Minor in Biochemistry

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

CHEM1042 General chemistry I (6)
CHEM1043 General chemistry II (6)
BIOC2600 Basic biochemistry (6)

BIOL2220 Principles of biochemistry (6)

CHEM2441 Organic chemistry I (6)

Disciplinary Electives (6 credits)

BIOC1600 Perspectives in biochemistry (6)

BIOL1110 From molecules to cells (6)

Take either BIOC1600 or BIOL1110 to fulfill this 6 credits requirement, but not both. Take either BIOC1600 or BIOL1110 to fulfill this 6 credits requirement, but not both.

Take either BIOC2600 or BIOL2220 to fulfill

Take either BIOC2600 or BIOL2220 to fulfill

this 24 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

this 24 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive

exclusive.

2. Advanced level courses (48 credits)

Disciplinary Core Courses (30 credits)

BIOC3601 Basic metabolism (6)

BIOC3604 Essential techniques in biochemistry and molecular biology (6)

BIOL3401 Molecular biology (6) BIOC4610 Advanced biochemistry (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOC3605 Sequence bioinformatics (6)
BIOC3606 Molecular medicine (6)
BIOL3202 Nutritional biochemistry (6)
BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3408 Genetics (6)

CHEM3441 Organic chemistry II (6)

BIOC4612 Molecular biology of the gene (6)

BIOL4417 'Omics' and systems biology (6)
CHEM4145 Medicinal chemistry (6)

CHEM4444 Chemical biology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
BIOC3999 Directed studies in biochemistry (6)
BIOC4966 Biochemistry internship (6)
BIOC4999 Biochemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks

Offered to students 2016

admitted to Year 1 in

Objectives:

The Major in Biochemistry aims to provide students with both basic and advanced knowledge in contemporary biochemistry and molecular biology. Core courses in the curriculum emphasize equipping students with a general understanding of the fundamental ideas, principles and theories of biochemistry with particular focus on the relevance of biochemistry, molecular biology and genomics to biology, human health and disease. Elective courses extend this core knowledge to provide students with specialized insight into both basic and applied scientific endeavour in biochemistry, bioinformatics, molecular biology and molecular genetics. Throughout the curriculum there is an emphasis on experiential learning through laboratory practicals, problem-solving exercises, group-based learning, industrial experience, overseas exchange and research-based projects. These experiences are designed to develop students' ability to read and interpret scientific data, to integrate knowledge with wider scientific theory, and to improve logical thinking and communication skills. The ultimate goal is to provide a comprehensive degree-level biochemistry education that equips students with the critical thinking, communication and analytical skills essential for them to play a leading role in society in the future.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the principles of biomolecular structure, metabolism, molecular interactions, molecular processes and their regulation, genetics and systems biology critical to contemporary biochemistry and molecular biology (by means of coursework and experiential learning)
- PLO 2: apply biochemical, bioinformatics and molecular genetics technologies for new observations, measurements and analyses; and to design experiments that bring discovery and insight into the unknown (by means of laboratory-based and research project-based learning)
- PLO 3: interpret and communicate scientific data and literature using appropriate scientific language (by means of literature-based coursework and debate)
- PLO 4: work effectively as a team and synergize with their colleagues in a supportive manner (by means of group-based learning and by group-based problem solving)
- PLO 5: recognize the interconnections of biochemistry with other disciplines in science, medicine and engineering, humanities and ethics, which are relevant for diverse working environment in the society (by means of multidisciplinary-based research projects, internship and debate)

Impermissible Combinations:

Minor in Biochemistry

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

CHEM1042 General chemistry I (6)
CHEM1043 General chemistry II (6)
BIOC2600 Basic biochemistry (6)

BIOL2220 Principles of biochemistry (6)

CHEM2441 Organic chemistry I (6)

Disciplinary Electives (6 credits)

BIOC1600 Perspectives in biochemistry (6)

BIOL1110 From molecules to cells (6)

Take either BIOC1600 or BIOL1110 to fulfill this 6 credits requirement, but not both. Take either BIOC1600 or BIOL1110 to fulfill this 6 credits requirement, but not both.

Take either BIOC2600 or BIOL2220 to fulfill

Take either BIOC2600 or BIOL2220 to fulfill

this 24 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

this 24 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive

exclusive.

2. Advanced level courses (48 credits)

Disciplinary Core Courses (30 credits)

BIOC3601 Basic metabolism (6)

BIOC3604 Essential techniques in biochemistry and molecular biology (6)

BIOL3401 Molecular biology (6) BIOC4610 Advanced biochemistry (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOC3605 Sequence bioinformatics (6)
BIOC3606 Molecular medicine (6)
BIOL3202 Nutritional biochemistry (6)
BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3408 Genetics (6)

CHEM3441 Organic chemistry II (6)

BIOC4612 Molecular biology of the gene (6)

BIOL4417 'Omics' and systems biology (6)
CHEM4145 Medicinal chemistry (6)
CHEM4444 Chemical biology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
BIOC3999 Directed studies in biochemistry (6)
BIOC4966 Biochemistry internship (6)
BIOC4999 Biochemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks

Offered to students 2015

admitted to Year 1 in

Objectives:

The Major in Biochemistry aims to provide students with both basic and advanced knowledge in contemporary biochemistry and molecular biology. Core courses in the curriculum emphasize equipping students with a general understanding of the fundamental ideas, principles and theories of biochemistry with particular focus on the relevance of biochemistry, molecular biology and genomics to biology, human health and disease. Elective courses extend this core knowledge to provide students with specialized insight into both basic and applied scientific endeavour in biochemistry, bioinformatics, molecular biology and molecular genetics. Throughout the curriculum there is an emphasis on experiential learning through laboratory practicals, problem-solving exercises, group-based learning, industrial experience, overseas exchange and research-based projects. These experiences are designed to develop students' ability to read and interpret scientific data, to integrate knowledge with wider scientific theory, and to improve logical thinking and communication skills. The ultimate goal is to provide a comprehensive degree-level biochemistry education that equips students with the critical thinking, communication and analytical skills essential for them to play a leading role in society in the future.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the principles of biomolecular structure, metabolism, molecular interactions, molecular processes and their regulation, genetics and systems biology critical to contemporary biochemistry and molecular biology (by means of coursework and experiential learning)
- PLO 2: apply biochemical, bioinformatics and molecular genetics technologies for new observations, measurements and analyses; and to design experiments that bring discovery and insight into the unknown (by means of laboratory-based and research project-based learning)
- PLO 3: interpret and communicate scientific data and literature using appropriate scientific language (by means of literature-based coursework and debate)
- PLO 4: work effectively as a team and synergize with their colleagues in a supportive manner (by means of group-based learning and by group-based problem solving)
- PLO 5: recognize the interconnections of biochemistry with other disciplines in science, medicine and engineering, humanities and ethics, which are relevant for diverse working environment in the society (by means of multidisciplinary-based research projects, internship and debate)

Impermissible Combinations:

Minor in Biochemistry

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

CHEM1042 General chemistry I (6)
CHEM1043 General chemistry II (6)
BIOC2600 Basic biochemistry (6)

BIOL2220 Principles of biochemistry (6)

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CHEM2441 Organic chemistry I (6)

Disciplinary Electives (6 credits)

BIOC1600 Perspectives in biochemistry (6)

BIOL1110 From molecules to cells (6)

Take either BIOC1600 or BIOL1110 to fulfill this 6 credits requirement, but not both. Take either BIOC1600 or BIOL1110 to fulfill this 6 credits requirement, but not both.

Take either BIOC2600 or BIOL2220 to fulfill

Take either BIOC2600 or BIOL2220 to fulfill

this 24 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

this 24 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive

exclusive.

2. Advanced level courses (48 credits)

Disciplinary Core Courses (30 credits)

BIOC3601 Basic metabolism (6)

BIOC3604 Essential techniques in biochemistry and molecular biology (6)

BIOL3401 Molecular biology (6) BIOC4610 Advanced biochemistry (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOC3605 Sequence bioinformatics (6)
BIOC3606 Molecular medicine (6)
BIOL3202 Nutritional biochemistry (6)
BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3408 Genetics (6)

CHEM3441 Organic chemistry II (6)

BIOC4612 Molecular biology of the gene (6)

BIOL4417 'Omics' and systems biology (6)
CHEM4145 Medicinal chemistry (6)

CHEM4444 Chemical biology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
BIOC3999 Directed studies in biochemistry (6)
BIOC4966 Biochemistry internship (6)
BIOC4999 Biochemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks

Offered to students 2014

admitted to Year 1 in

Objectives:

The Major in Biochemistry aims to provide students with both basic and advanced knowledge in contemporary biochemistry and molecular biology. Core courses in the curriculum emphasize equipping students with a general understanding of the fundamental ideas, principles and theories of biochemistry with particular focus on the relevance of biochemistry, molecular biology and genomics to biology, human health and disease. Elective courses extend this core knowledge to provide students with specialized insight into both basic and applied scientific endeavour in biochemistry, bioinformatics, molecular biology and molecular genetics. Throughout the curriculum there is an emphasis on experiential learning through laboratory practicals, problem-solving exercises, group-based learning, industrial experience, overseas exchange and research-based projects. These experiences are designed to develop students' ability to read and interpret scientific data, to integrate knowledge with wider scientific theory, and to improve logical thinking and communication skills. The ultimate goal is to provide a comprehensive degree-level biochemistry education that equips students with the critical thinking, communication and analytical skills essential for them to play a leading role in society in the future.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the principles of biomolecular structure, metabolism, molecular interactions, molecular processes and their regulation, genetics and systems biology critical to contemporary biochemistry and molecular biology (by means of coursework and experiential learning)
- PLO 2: apply biochemical, bioinformatics and molecular genetics technologies for new observations, measurements and analyses; and to design experiments that bring discovery and insight into the unknown (by means of laboratory-based and research project-based learning)
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- PLO 5: recognize the interconnections of biochemistry with other disciplines in science, medicine and engineering, humanities and ethics, which are relevant for diverse working environment in the society (by means of multidisciplinary-based research projects, internship and debate)

Impermissible Combinations:

Minor in Biochemistry

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

BIOC1600 Perspectives in biochemistry (6)
BIOL1110 From molecules to cells (6)
CHEM1042 General chemistry I (6)
BIOC2600 Basic biochemistry (6)
CHEM2441 Organic chemistry I (6)

Disciplinary Electives (6 credits)

CHEM1043 General chemistry II (6)

CHEM2541 Introductory physical chemistry (6)

Take either CHEM1043 or CHEM2541 to fulfill this 6 credits requirement, but not both. Take either CHEM1043 or CHEM2541 to fulfill this 6 credits requirement, but not both.

2. Advanced level courses (42 credits)

Disciplinary Core Courses (30 credits)

BIOC3601 Basic metabolism (6)

BIOC3604 Essential techniques in biochemistry and molecular biology (6)

BIOL3401 Molecular biology (6) BIOC4610 Advanced biochemistry (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOC3605 Sequence bioinformatics (6)
BIOC3606 Molecular medicine (6)
BIOL3202 Nutritional biochemistry (6)

BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3408 Genetics (6) CHEM3441 Organic chemistry II (6)

BIOC4612 Molecular biology of the gene (6)
BIOL4417 'Omics' and systems biology (6)
CHEM4145 Medicinal chemistry (6)

CHEM4444 Chemical biology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOC3999	Directed studies in biochemistry (6)
BIOC4966	Biochemistry internship (6)
BIOC4999	Biochemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks

Offered to students 2013

admitted to Year 1 in

Objectives:

The Major in Biochemistry aims to provide students with both basic and advanced knowledge in contemporary biochemistry and molecular biology. Core courses in the curriculum emphasize equipping students with a general understanding of the fundamental ideas, principles and theories of biochemistry with particular focus on the relevance of biochemistry, molecular biology and genomics to biology, human health and disease. Elective courses extend this core knowledge to provide students with specialized insight into both basic and applied scientific endeavour in biochemistry, bioinformatics, molecular biology and molecular genetics. Throughout the curriculum there is an emphasis on experiential learning through laboratory practicals, problem-solving exercises, group-based learning, industrial experience, overseas exchange and research-based projects. These experiences are designed to develop students' ability to read and interpret scientific data, to integrate knowledge with wider scientific theory, and to improve logical thinking and communication skills. The ultimate goal is to provide a comprehensive degree-level biochemistry education that equips students with the critical thinking, communication and analytical skills essential for them to play a leading role in society in the future.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the principles of biomolecular structure, metabolism, molecular interactions, molecular processes and their regulation, genetics and systems biology critical to contemporary biochemistry and molecular biology (by means of coursework and experiential learning)
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- PLO 5: recognize the interconnections of biochemistry with other disciplines in science, medicine and engineering, humanities and ethics, which are relevant for diverse working environment in the society (by means of multidisciplinary-based research projects, internship and debate)

Impermissible Combinations:

Minor in Biochemistry

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

BIOC1600 Perspectives in biochemistry (6)
BIOL1110 From molecules to cells (6)
CHEM1042 General chemistry I (6)
BIOC2600 Basic biochemistry (6)
CHEM2441 Organic chemistry I (6)

Disciplinary Electives (6 credits)

CHEM1043 General chemistry II (6)

CHEM2541 Introductory physical chemistry (6)

Take either CHEM1043 or CHEM2541 to fulfill this 6 credits requirement, but not both. Take either CHEM1043 or CHEM2541 to fulfill this 6 credits requirement, but not both.

2. Advanced level courses (42 credits)

Disciplinary Core Courses (30 credits)

BIOC3601 Basic metabolism (6)

BIOC3604 Essential techniques in biochemistry and molecular biology (6)

BIOL3401 Molecular biology (6)
BIOC4610 Advanced biochemistry (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOC3605 Sequence bioinformatics (6)
BIOC3606 Molecular medicine (6)
BIOL3202 Nutritional biochemistry (6)

BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3408 Genetics (6) CHEM3441 Organic chemistry II (6)

BIOC4612 Molecular biology of the gene (6)
BIOL4417 'Omics' and systems biology (6)
CHEM4145 Medicinal chemistry (6)

CHEM4444 Chemical biology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOC3999	Directed studies in biochemistry (6)
BIOC4966	Biochemistry internship (6)
BIOC4999	Biochemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks:

Offered to students 2012

admitted to Year 1 in

Objectives:

The Major in Biochemistry aims to provide students with both basic and advanced knowledge in contemporary biochemistry and molecular biology. Core courses in the curriculum emphasize equipping students with a general understanding of the fundamental ideas, principles and theories of biochemistry with particular focus on the relevance of biochemistry, molecular biology and genomics to biology, human health and disease. Elective courses extend this core knowledge to provide students with specialized insight into both basic and applied scientific endeavour in biochemistry, bioinformatics, molecular biology and molecular genetics. Throughout the curriculum there is an emphasis on experiential learning through laboratory practicals, problem-solving exercises, group-based learning, industrial experience, overseas exchange and research-based projects. These experiences are designed to develop students' ability to read and interpret scientific data, to integrate knowledge with wider scientific theory, and to improve logical thinking and communication skills. The ultimate goal is to provide a comprehensive degree-level biochemistry education that equips students with the critical thinking, communication and analytical skills essential for them to play a leading role in society in the future.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the principles of biomolecular structure, metabolism, molecular interactions, molecular processes and their regulation, genetics and systems biology critical to contemporary biochemistry and molecular biology (by means of coursework and experiential learning)
- PLO 2: apply biochemical, bioinformatics and molecular genetics technologies for new observations, measurements and analyses; and to design experiments that bring discovery and insight into the unknown (by means of laboratory-based and research project-based learning)
- PLO 3: interpret and communicate scientific data and literature using appropriate scientific language (by means of literature-based coursework and debate)
- PLO 4: work effectively as a team and synergize with their colleagues in a supportive manner (by means of group-based learning and by group-based problem solving)
- PLO 5: recognize the interconnections of biochemistry with other disciplines in science, medicine and engineering, humanities and ethics, which are relevant for diverse working environment in the society (by means of multidisciplinary-based research projects, internship and debate)

Impermissible Combinations:

Minor in Biochemistry

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

BIOC1600 Perspectives in biochemistry (6)
BIOL1110 From molecules to cells (6)
CHEM1042 General chemistry I (6)
BIOC2600 Basic biochemistry (6)
CHEM2441 Organic chemistry I (6)

Disciplinary Electives (6 credits)

CHEM1043 General chemistry II (6)

CHEM2541 Introductory physical chemistry (6)

Take either CHEM1043 or CHEM2541 to fulfill this 6 credits requirement, but not both. Take either CHEM1043 or CHEM2541 to fulfill this 6 credits requirement, but not both.

2. Advanced level courses (42 credits)

Disciplinary Core Courses (30 credits)

BIOC3601 Basic metabolism (6)

BIOC3604 Essential techniques in biochemistry and molecular biology (6)

BIOL3401 Molecular biology (6)
BIOC4610 Advanced biochemistry (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOC3605 Sequence bioinformatics (6)
BIOC3606 Molecular medicine (6)
BIOL3202 Nutritional biochemistry (6)

BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3408 Genetics (6)
CHEM3441 Organic chemistry II (6)
BIOC4612 Molecular biology of the

BIOC4612 Molecular biology of the gene (6)
BIOL4417 'Omics' and systems biology (6)
CHEM4145 Medicinal chemistry (6)

CHEM4444 Chemical biology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOC3999	Directed studies in biochemistry (6)
BIOC4966	Biochemistry internship (6)
BIOC4999	Biochemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 5. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks:

Major Title Major in Biological Sciences

Offered to students 2020

admitted to Year 1 in

Objectives:

This Major is designed for students seeking a broad-based training in modern biology. Students are guided in an inquiry-driven learning environment to appreciate the major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The programme is highly flexible as students can select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further exposed to three fundamental areas of biological sciences (genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology) and will undertake experiential learning activities. The diverse learning experience exposes students to problem-based learning, and an exciting array of laboratory and field techniques. Students will also be able to acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major applies modern scientific inquiry to prepare graduates for employment as professionals in a variety of careers or for postgraduate study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and explain the key concepts in genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 2: analyze and interpret quantitative and qualitative biological data to provide scientifically based conclusions and/or judgements (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 3: tackle biological research problems by formulating hypothesis and designing experimental investigations (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 4: communicate effectively and professionally with scientists, educators, media, and general public in oral and written forms (by means of coursework, laboratory- and/or research-based learning, and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Biological Sciences (Intensive)

Major in Ecology & Biodiversity (Intensive)

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

Scientific method and reasoning (6) SCNC1111 SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

From molecules to cells (6) BIOL1110 BIOL1309 Evolutionary diversity (6) Biostatistics (6) **BIOL2102**

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

BIOL2306 Ecology and evolution (6)

BIOC2600 Basic biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

2. Advanced level courses (at least 42 credits)

Disciplinary Electives (42 credits)

(A) Genetics, molecular and cell biology (at least 12 credits selected from area A)

BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (6) Protein structure and function (6) BIOL3404

Genetics (6) **BIOL3408**

(B) Ecology, systematics and evolution (at least 12 credits selected from area B)

Marine biology (6) BIOL3301 Systematics and phylogenetics (6) BIOL3302 Conservation biology (6) BIOL3303

Tropical terrestrial ecology (6) BIOL3319 Evolutionary biology (6) BIOL3506

(C) Physiology and organismic biology (at least 18 credits with 6 credits from each of List I, II & III) List I

Animal physiology and environmental adaptation (6) BIOL3105 Human physiology (6) BIOL3205

BIOL3403 **BIOL3406** Reproduction and reproductive biotechnology (6)

BIOL3503 Endocrinology: human physiology II (6) List II

Immunology (6)

Plant structure and evolution (6) BIOL3314 Plant physiology and climate change (6) ENVS3202 BIOL4411 Plant and food biotechnology (6)

List III

BIOL3109 Environmental microbiology (6)

BIOL3203 Food microbiology (6)

BIOL3508 Microbial physiology and biotechnology (6)
BIOL4401 Medical microbiology and applied immunology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
BIOL3994 Directed studies in biological sciences (6)
BIOL4964 Biological sciences internship (6)
BIOL4994 Biological sciences project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Major Title Major in Biological Sciences

Offered to students 2019

admitted to Year 1 in

Objectives:

This Major is designed for students seeking a broad-based training in modern biology. Students are guided in an inquiry-driven learning environment to appreciate the major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The programme is highly flexible as students can select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further exposed to three fundamental areas of biological sciences (genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology) and will undertake experiential learning activities. The diverse learning experience exposes students to problem-based learning, and an exciting array of laboratory and field techniques. Students will also be able to acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major applies modern scientific inquiry to prepare graduates for employment as professionals in a variety of careers or for postgraduate study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand concepts underpinning advances in genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: evaluate diverse threads of enquiry in science, and identify the value of datasets and written output (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: interpret scientific data from a range of sources and explain trends observed (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: demonstrate independent and critical thinking and appreciate moral and ethical issues related to biological sciences (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: communicate in a professional capacity with educators, business, media and the scientific community (by means of coursework, tutorial classes, project-based and presentation opportunities in the curriculum)
- PLO 6: be prepared to enter employment as professional scientists, educators and managers (by means of coursework, tutorial classes, laboratory-based, project-based and capstone learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity (Intensive)

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

BIOL2306 Ecology and evolution (6)
BIOC2600 Basic biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

2. Advanced level courses (at least 42 credits)

Disciplinary Electives (42 credits)

(A) Genetics, molecular and cell biology (at least 12 credits selected from area A)

BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (6)
BIOL3404 Protein structure and function (6)

BIOL3408 Genetics (6)

(B) Ecology, systematics and evolution (at least 12 credits selected from area B)

BIOL3301 Marine biology (6)
BIOL3302 Systematics and phylogenetics (6)
BIOL3303 Conservation biology (6)
BIOL3319 Tropical terrestrial ecology (6)

BIOL3506 Evolutionary biology (6) (C) Physiology and organismic biology (at least 18 credits with 6 credits from each of List I, II & III)

List I

BIOL3105 Animal physiology and environmental adaptation (6)

BIOL3205 Human physiology (6) BIOL3403 Immunology (6)

BIOL3406 Reproduction and reproductive biotechnology (6)

BIOL3503 Endocrinology: human physiology II (6)

List II

BIOL3107	Plant physiology (6)
DIOL 2014	Digitative and evalution (C)
BIOL3314	Plant structure and evolution (6)
ENVS3202	Plant physiology and climate change (6)
DIOL 4444	Dient and food histochnology (6)
BIOL4411	Plant and food biotechnology (6)
List III	
BIOL3109	Environmental microbiology (6)
BIOL3203	Food microbiology (6)
BIOL3508	Microbial physiology and biotechnology (6)
BIOL4401	Medical microbiology and applied immunology (6)
3. Capstone requirem	ent (6 credits)
At least 6 credits se	lected from the following courses:
BIOL3994	Directed studies in biological sciences (6)
BIOL4964	Biological sciences internship (6)
BIOL4994	Biological sciences project (12)

Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.

Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Biological Sciences

Offered to students 2018

admitted to Year 1 in

Objectives:

This Major is designed for students seeking a broad-based training in modern biology. Students are guided in an inquiry-driven learning environment to appreciate the major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The programme is highly flexible as students can select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further exposed to three fundamental areas of biological sciences (genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology) and will undertake experiential learning activities. The diverse learning experience exposes students to problem-based learning, and an exciting array of laboratory and field techniques. Students will also be able to acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major applies modern scientific inquiry to prepare graduates for employment as professionals in a variety of careers or for postgraduate study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand concepts underpinning advances in genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: evaluate diverse threads of enquiry in science, and identify the value of datasets and written output (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: interpret scientific data from a range of sources and explain trends observed (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: demonstrate independent and critical thinking and appreciate moral and ethical issues related to biological sciences (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: communicate in a professional capacity with educators, business, media and the scientific community (by means of coursework, tutorial classes, project-based and presentation opportunities in the curriculum)
- PLO 6: be prepared to enter employment as professional scientists, educators and managers (by means of coursework, tutorial classes, laboratory-based, project-based and capstone learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity (Intensive)

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

Scientific method and reasoning (6) SCNC1111 SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

From molecules to cells (6) BIOL1110 BIOL1309 Evolutionary diversity (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

BIOL2306 Ecology and evolution (6) Basic biochemistry (6) BIOC2600

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

2. Advanced level courses (at least 42 credits)

Disciplinary Electives (42 credits)

(A) Genetics, molecular and cell biology (at least 12 credits selected from area A)

Molecular biology (6) BIOL3401

BIOL3402 Cell biology and cell technology (6) Protein structure and function (6) BIOL3404

BIOL3408 Genetics (6)

(B) Ecology, systematics and evolution (at least 12 credits selected from area B)

BIOL3301 Marine biology (6)

Systematics and phylogenetics (6) BIOL3302

Conservation biology (6) **BIOL3303**

BIOL3419 Insect ecology: the little things that run the world (6)

BIOL3501 Evolution (6) Take either BIOL3501 or BIOL3506 to fulfill this 12 credits requirement, but not both. BIOL3501 and BIOL3506 are mutually

exclusive.

BIOL3506 Evolutionary biology (6) Take either BIOL3501 or BIOL3506 to fulfill this 12 credits requirement, but not both.

BIOL3501 and BIOL3506 are mutually

exclusive

(C) Physiology and organismic biology (at least 18 credits with 6 credits from each of List I, II & III)

BIOL3105 BIOL3205 BIOL3403 BIOL3406 BIOL3503	Animal physiology and environmental adaptation (6) Human physiology (6) Immunology (6) Reproduction and reproductive biotechnology (6) Endocrinology: human physiology II (6)	
BIOL3107	Plant physiology (6)	Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL3314	Plant structure and evolution (6)	
ENVS3202	Plant physiology and climate change (6)	Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL4411	Plant and food biotechnology (6)	
List III		
BIOL3109	Environmental microbiology (6)	
BIOL3203	Food microbiology (6)	
BIOL3508	Microbial physiology and biotechnology (6)	
BIOL4401	Medical microbiology and applied immunology (6)	
3. Capstone requiren	nent (6 credits)	
At least 6 credits se	elected from the following courses:	
BIOL3994	Directed studies in biological sciences (6)	
BIOL4964	Biological sciences internship (6)	
BIOL4994	Biological sciences project (12)	

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details

Remarks:

Major Title Major in Biological Sciences

Offered to students 2017

admitted to Year 1 in

Objectives:

This Major is designed for students seeking a broad-based training in modern biology. Students are guided in an inquiry-driven learning environment to appreciate the major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The programme is highly flexible as students can select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further exposed to three fundamental areas of biological sciences (genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology) and will undertake experiential learning activities. The diverse learning experience exposes students to problem-based learning, and an exciting array of laboratory and field techniques. Students will also be able to acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major applies modern scientific inquiry to prepare graduates for employment as professionals in a variety of careers or for postgraduate study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand concepts underpinning advances in genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: evaluate diverse threads of enquiry in science, and identify the value of datasets and written output (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: interpret scientific data from a range of sources and explain trends observed (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: demonstrate independent and critical thinking and appreciate moral and ethical issues related to biological sciences (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: communicate in a professional capacity with educators, business, media and the scientific community (by means of coursework, tutorial classes, project-based and presentation opportunities in the curriculum)
- PLO 6: be prepared to enter employment as professional scientists, educators and managers (by means of coursework, tutorial classes, laboratory-based, project-based and capstone learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity (Intensive)

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

Scientific method and reasoning (6) SCNC1111 SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

From molecules to cells (6) BIOL1110 BIOL1309 Evolutionary diversity (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

BIOL2306 Ecology and evolution (6) Basic biochemistry (6) BIOC2600

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

2. Advanced level courses (at least 42 credits)

Disciplinary Electives (42 credits)

(A) Genetics, molecular and cell biology (at least 12 credits selected from area A)

BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (6) Protein structure and function (6) BIOL3404

BIOL3408 Genetics (6)

(B) Ecology, systematics and evolution (at least 12 credits selected from area B)

BIOL3301 Marine biology (6)

Systematics and phylogenetics (6) BIOL3302

Conservation biology (6) **BIOL3303**

BIOL3419 Insect ecology: the little things that run the world (6)

BIOL3501 Evolution (6)

Evolutionary biology (6)

Take either BIOL3501 or BIOL3506 to fulfill this 12 credits requirement, but not both. BIOL3501 and BIOL3506 are mutually exclusive.

Take either BIOL3501 or BIOL3506 to fulfill this 12 credits requirement, but not both. BIOL3501 and BIOL3506 are mutually

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(C) Physiology and organismic biology (at least 18 credits with 6 credits from each of List I, II & III)

BIOL3506

BIOL3105 BIOL3205 BIOL3403 BIOL3406 BIOL3503	Animal physiology and environmental adaptation (6) Human physiology (6) Immunology (6) Reproduction and reproductive biotechnology (6) Endocrinology: human physiology II (6)	
BIOL3107	Plant physiology (6)	Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL3314	Plant structure and evolution (6)	
ENVS3202	Plant physiology and climate change (6)	Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL4411 List III	Plant and food biotechnology (6)	
BIOL3109	Environmental microbiology (6)	
BIOL3203	Food microbiology (6)	
BIOL3508	Microbial physiology and biotechnology (6)	
BIOL4401	Medical microbiology and applied immunology (6)	
3. Capstone requir	rement (6 credits)	
At least 6 credits	selected from the following courses:	
BIOL3994	Directed studies in biological sciences (6)	
BIOL4964	Biological sciences internship (6)	
BIOL4994	Biological sciences project (12)	

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details

Remarks:

Major Title Major in Biological Sciences

Offered to students 2016

admitted to Year 1 in

Objectives:

This Major is designed for students seeking a broad-based training in modern biology. Students are guided in an inquiry-driven learning environment to appreciate the major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The programme is highly flexible as students can select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further exposed to three fundamental areas of biological sciences (genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology) and will undertake experiential learning activities. The diverse learning experience exposes students to problem-based learning, and an exciting array of laboratory and field techniques. Students will also be able to acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major applies modern scientific inquiry to prepare graduates for employment as professionals in a variety of careers or for postgraduate study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand concepts underpinning advances in genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: evaluate diverse threads of enquiry in science, and identify the value of datasets and written output (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: interpret scientific data from a range of sources and explain trends observed (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: demonstrate independent and critical thinking and appreciate moral and ethical issues related to biological sciences (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: communicate in a professional capacity with educators, business, media and the scientific community (by means of coursework, tutorial classes, project-based and presentation opportunities in the curriculum)
- PLO 6: be prepared to enter employment as professional scientists, educators and managers (by means of coursework, tutorial classes, laboratory-based, project-based and capstone learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity (Intensive)

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

Scientific method and reasoning (6) SCNC1111 SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

From molecules to cells (6) BIOL1110 BIOL1309 Evolutionary diversity (6) BIOL2102

Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

BIOL2306 Ecology and evolution (6) Basic biochemistry (6) BIOC2600

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

2. Advanced level courses (at least 42 credits)

Disciplinary Electives (42 credits)

(A) Genetics, molecular and cell biology (at least 12 credits selected from area A)

BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (6) Protein structure and function (6) BIOL3404

BIOL3408 Genetics (6)

(B) Ecology, systematics and evolution (at least 12 credits selected from area B)

BIOL3301 Marine biology (6)

Systematics and phylogenetics (6) BIOL3302

Conservation biology (6) **BIOL3303**

BIOL3419 Insect ecology: the little things that run the world (6)

Evolutionary biology (6)

BIOL3501 Evolution (6)

Take either BIOL3501 or BIOL3506 to fulfill this 12 credits requirement, but not both. BIOL3501 and BIOL3506 are mutually exclusive.

Take either BIOL3501 or BIOL3506 to fulfill this 12 credits requirement, but not both. BIOL3501 and BIOL3506 are mutually

exclusive

(C) Physiology and organismic biology (at least 18 credits with 6 credits from each of List I, II & III)

BIOL3506

BIOL3105 BIOL3205 BIOL3403 BIOL3406 BIOL3503	Animal physiology and environmental adaptation (6) Human physiology (6) Immunology (6) Reproduction and reproductive biotechnology (6) Endocrinology: human physiology II (6)	
BIOL3107	Plant physiology (6)	Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL3314	Plant structure and evolution (6)	
ENVS3202	Plant physiology and climate change (6)	Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL4411 List III	Plant and food biotechnology (6)	
BIOL3109	Environmental microbiology (6)	
BIOL3203	Food microbiology (6)	
BIOL3508	Microbial physiology and biotechnology (6)	
BIOL4401	Medical microbiology and applied immunology (6)	
3. Capstone requir	rement (6 credits)	
At least 6 credits	selected from the following courses:	
BIOL3994	Directed studies in biological sciences (6)	
BIOL4964	Biological sciences internship (6)	
BIOL4994	Biological sciences project (12)	

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details

Remarks:

Major Title Major in Biological Sciences

Offered to students 2015

admitted to Year 1 in

Objectives:

This Major is designed for students seeking a broad-based training in modern biology. Students are guided in an inquiry-driven learning environment to appreciate the major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The programme is highly flexible as students can select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further allowed to specialize in areas such as microbiology, genetics & cytology, physiology & homeostasis, or diversity of life & environmental biology and undertake experiential learning activities. The diverse learning experience exposes students to problem-based learning, and an exciting array of laboratory and field techniques. Students will also be able to acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major applies modern scientific inquiry to prepare graduates for employment as professionals in a variety of careers or for postgraduate study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand concepts underpinning advances in cell biology and genetics, physiology and systems biology, diversity of life and environmental biology, and applied biology (by means of coursework, tutorial classes and laboratorybased learning in the curriculum)
- PLO 2: evaluate diverse threads of enquiry in science, and identify the value of datasets and written output (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: interpret scientific data from a range of sources and explain trends observed (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: demonstrate independent and critical thinking and appreciate moral and ethical issues related to biological sciences (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: communicate in a professional capacity with educators, business, media and the scientific community (by means of coursework, tutorial classes, project-based and presentation opportunities in the curriculum)
- PLO 6: be prepared to enter employment as professional scientists, educators and managers (by means of coursework, tutorial classes, laboratory-based, project-based and capstone learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity (Intensive)

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) Fundamentals of modern science (6) **SCNC1112**

Disciplinary Core Courses (36 credits)

From molecules to cells (6) BIOL1110 BIOL1309 Evolutionary diversity (6) Biostatistics (6) BIOL2102

BIOL2103 Biological sciences laboratory course (6) **BIOL2220**

Principles of biochemistry (6) Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

BIOL2306 Ecology and evolution (6)

Basic biochemistry (6) Take either BIOL2220 and BIOC2600 to fulfill **BIOC2600**

this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

2. Advanced level courses (at least 42 credits)

Disciplinary Electives (42 credits)

Students must select at least 6 credits from each of the following area A, B, C & D:

(A) Genetics and cell biology

BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6) BIOL3408 Genetics (6)

(B) Physiology and systems biology

Animal physiology and environmental adaptation (6) BIOL3105

BIOL3107 Plant physiology (6) **BIOL3108** Microbial physiology (6)

Take either BIOI 3108 or BIOI 3508 to fulfill this 42 credits requirement, but not both. BIOL3108 and BIOL3508 are mutually

exclusive.

BIOL3205 Human physiology (6)

BIOL3508 Microbial physiology and biotechnology (6)

Take either BIOL3108 or BIOL3508 to fulfill this 42 credits requirement, but not both. BIOL3108 and BIOL3508 are mutually exclusive.

(C) Diversity of life and environmental biology

BIOL3109 Environmental microbiology (6) BIOL3110 Environmental toxicology (6)

BIOL3301 Marine biology (6)

BIOL3302 Systematics and phylogenetics (6)

(D) Applied biology

BIOL3303 Conservation biology (6)

BIOL3409 Business aspects of biotechnology (6)

BIOL4301 Fish and fisheries (6)

BIOL4401 Medical microbiology and applied immunology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
BIOL3994 Directed studies in biological sciences (6)
BIOL4964 Biological sciences internship (6)
BIOL4994 Biological sciences project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Biological Sciences

Offered to students 2014

admitted to Year 1 in

Objectives:

This Major is designed for students seeking a broad-based training in modern biology. Students are guided in an inquiry-driven learning environment to appreciate the major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The programme is highly flexible as students can select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further allowed to specialize in areas such as microbiology, genetics & cytology, physiology & homeostasis, or diversity of life & environmental biology and undertake experiential learning activities. The diverse learning experience exposes students to problem-based learning, and an exciting array of laboratory and field techniques. Students will also be able to acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major applies modern scientific inquiry to prepare graduates for employment as professionals in a variety of careers or for postgraduate study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand concepts underpinning advances in cell biology and genetics, physiology and systems biology, diversity of life and environmental biology, and applied biology (by means of coursework, tutorial classes and laboratorybased learning in the curriculum)
- PLO 2: evaluate diverse threads of enquiry in science, and identify the value of datasets and written output (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: interpret scientific data from a range of sources and explain trends observed (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: demonstrate independent and critical thinking and appreciate moral and ethical issues related to biological sciences (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: communicate in a professional capacity with educators, business, media and the scientific community (by means of coursework, tutorial classes, project-based and presentation opportunities in the curriculum)
- PLO 6: be prepared to enter employment as professional scientists, educators and managers (by means of coursework, tutorial classes, laboratory-based, project-based and capstone learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity (Intensive)

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

Scientific method and reasoning (6) SCNC1111 Fundamentals of modern science (6) SCNC1112

Disciplinary Core Courses (36 credits)

From molecules to cells (6) BIOL1110 **BIOL1111** Introductory microbiology (6) Evolutionary diversity (6) BIOL1309 BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

Ecology and evolution (6) **BIOL 2306**

2. Advanced level courses (at least 42 credits)

Disciplinary Electives (42 credits)

Students must select at least 6 credits from each of the following area A, B, C & D:

(A) Genetics and cell biology

BIOL3401 Molecular biology (6)

Cell biology and cell technology (6) BIOL3402

BIOL3403 Immunology (6) Genetics (6) **BIOL3408** (B) Physiology and systems biology

BIOL3105 Animal physiology and environmental adaptation (6)

Plant physiology (6) BIOL3107 **BIOL3108**

Microbial physiology (6)

Take either BIOL3108 or BIOL3508 to fulfill this 42 credits requirement, but not both. BIOL3108 and BIOL3508 are mutually exclusive.

Human physiology (6) BIOL3205

Microbial physiology and biotechnology (6) **BIOL3508**

Take either BIOL3108 or BIOL3508 to fulfill this 42 credits requirement, but not both. BIOL3108 and BIOL3508 are mutually exclusive.

(C) Diversity of life and environmental biology

BIOL3109 Environmental microbiology (6) Environmental toxicology (6) BIOL3110 BIOL3301 Marine biology (6)

Systematics and phylogenetics (6) BIOL3302

(D) Applied biology

Conservation biology (6) **BIOL3303**

BIOL3409 Business aspects of biotechnology (6) BIOL4301 Fish and fisheries (6)

BIOL4401 Medical microbiology and applied immunology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
BIOL3994 Directed studies in biological sciences (6)

BIOL4964 Biological sciences internship (6) BIOL4994 Biological sciences project (12)

Notes:

- 1. BIOL1111 Introductory Microbiology is not offered from 2015-16. Students should take either BIOL2220 Principles of biochemistry or BIOC2600 Basic biochemistry as a replacement, both BIOL2220 and BIOC2600 are mutually exclusive.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Biological Sciences

Offered to students 2013

admitted to Year 1 in

Objectives:

This Major is designed for students seeking a broad-based training in modern biology. Students are guided in an inquiry-driven learning environment to appreciate the major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The programme is highly flexible as students can select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further allowed to specialize in areas such as microbiology, genetics & cytology, physiology & homeostasis, or diversity of life & environmental biology and undertake experiential learning activities. The diverse learning experience exposes students to problem-based learning, and an exciting array of laboratory and field techniques. Students will also be able to acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major applies modern scientific inquiry to prepare graduates for employment as professionals in a variety of careers or for postgraduate study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand concepts underpinning advances in cell biology and genetics, physiology and systems biology, diversity of life and environmental biology, and applied biology (by means of coursework, tutorial classes and laboratorybased learning in the curriculum)
- PLO 2: evaluate diverse threads of enquiry in science, and identify the value of datasets and written output (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: interpret scientific data from a range of sources and explain trends observed (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: demonstrate independent and critical thinking and appreciate moral and ethical issues related to biological sciences (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: communicate in a professional capacity with educators, business, media and the scientific community (by means of coursework, tutorial classes, project-based and presentation opportunities in the curriculum)
- PLO 6: be prepared to enter employment as professional scientists, educators and managers (by means of coursework, tutorial classes, laboratory-based, project-based and capstone learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity (Intensive)

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

Scientific method and reasoning (6) SCNC1111 Fundamentals of modern science (6) **SCNC1112**

Disciplinary Core Courses (36 credits)

From molecules to cells (6) BIOL1110 **BIOL1111** Introductory microbiology (6) Evolutionary diversity (6) BIOL1309 BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

Ecology and evolution (6) **BIOL 2306**

2. Advanced level courses (at least 42 credits)

Disciplinary Electives (42 credits)

Students must select at least 6 credits from each of the following area A, B, C & D:

(A) Genetics and cell biology

BIOL3401 Molecular biology (6)

Cell biology and cell technology (6) BIOL3402

BIOL3403 Immunology (6) Genetics (6) **BIOL3408** (B) Physiology and systems biology

BIOL3105 Animal physiology and environmental adaptation (6)

Plant physiology (6) BIOL3107 **BIOL3108**

Microbial physiology (6)

Take either BIOL3108 or BIOL3508 to fulfill this 42 credits requirement, but not both. BIOL3108 and BIOL3508 are mutually

exclusive.

Human physiology (6) BIOL3205

Microbial physiology and biotechnology (6) **BIOL3508**

Take either BIOL3108 or BIOL3508 to fulfill this 42 credits requirement, but not both. BIOL3108 and BIOL3508 are mutually exclusive.

(C) Diversity of life and environmental biology

BIOL3109 Environmental microbiology (6) Environmental toxicology (6) BIOL3110

BIOL3301 Marine biology (6) Systematics and phylogenetics (6) BIOL3302

(D) Applied biology

Conservation biology (6) **BIOL3303**

BIOL3409 Business aspects of biotechnology (6) BIOL4301 Fish and fisheries (6)

BIOL4401 Medical microbiology and applied immunology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
BIOL3994 Directed studies in biological sciences (6)
BIOL4964 Biological sciences internship (6)

BIOL4994 Biological sciences project (12)

Notes:

- 1. BIOL1111 Introductory Microbiology is not offered from 2015-16. Students should take either BIOL2220 Principles of biochemistry or BIOC2600 Basic biochemistry as a replacement, both BIOL2220 and BIOC2600 are mutually exclusive.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details

Remarks:

Major Title Major in Biological Sciences

Offered to students 2012

admitted to Year 1 in

Objectives:

This Major is designed for students seeking a broad-based training in modern biology. Students are guided in an inquiry-driven learning environment to appreciate the major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The programme is highly flexible as students can select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further allowed to specialize in areas such as microbiology, genetics & cytology, physiology & homeostasis, or diversity of life & environmental biology and undertake experiential learning activities. The diverse learning experience exposes students to problem-based learning, and an exciting array of laboratory and field techniques. Students will also be able to acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major applies modern scientific inquiry to prepare graduates for employment as professionals in a variety of careers or for postgraduate study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand concepts underpinning advances in cell biology and genetics, physiology and systems biology, diversity of life and environmental biology, and applied biology (by means of coursework, tutorial classes and laboratorybased learning in the curriculum)
- PLO 2: evaluate diverse threads of enquiry in science, and identify the value of datasets and written output (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: interpret scientific data from a range of sources and explain trends observed (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: demonstrate independent and critical thinking and appreciate moral and ethical issues related to biological sciences (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: communicate in a professional capacity with educators, business, media and the scientific community (by means of coursework, tutorial classes, project-based and presentation opportunities in the curriculum)
- PLO 6: be prepared to enter employment as professional scientists, educators and managers (by means of coursework, tutorial classes, laboratory-based, project-based and capstone learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity (Intensive)

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) Fundamentals of modern science (6) **SCNC1112**

Disciplinary Core Courses (36 credits)

From molecules to cells (6) BIOL1110 **BIOL1111** Introductory microbiology (6) Evolutionary diversity (6) BIOL1309 BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

Ecology and evolution (6) **BIOL 2306**

2. Advanced level courses (at least 42 credits)

Disciplinary Electives (42 credits)

Students must select at least 6 credits from each of the following area A, B, C & D:

(A) Genetics and cell biology

BIOL3401 Molecular biology (6)

Cell biology and cell technology (6) BIOL3402

BIOL3403 Immunology (6) Genetics (6) **BIOL3408** (B) Physiology and systems biology

BIOL3105 Animal physiology and environmental adaptation (6)

Plant physiology (6) BIOL3107 **BIOL3108**

Microbial physiology (6)

Take either BIOL3108 or BIOL3508 to fulfill this 42 credits requirement, but not both. BIOL3108 and BIOL3508 are mutually exclusive.

Human physiology (6) BIOL3205

Microbial physiology and biotechnology (6) **BIOL3508**

Take either BIOL3108 or BIOL3508 to fulfill this 42 credits requirement, but not both. BIOL3108 and BIOL3508 are mutually exclusive.

(C) Diversity of life and environmental biology

BIOL3109 Environmental microbiology (6) Environmental toxicology (6) BIOL3110 BIOL3301 Marine biology (6)

Systematics and phylogenetics (6) BIOL3302

(D) Applied biology

Conservation biology (6) **BIOL3303**

BIOL3409 Business aspects of biotechnology (6) BIOL4301 Fish and fisheries (6)

BIOL4401 Medical microbiology and applied immunology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
BIOL3994 Directed studies in biological sciences (6)
BIOI 4964 Biological sciences internship (6)

BIOL4964 Biological sciences internship (6 BIOL4994 Biological sciences project (12)

Notes:

- 1. BIOL1111 Introductory Microbiology is not offered from 2015-16. Students should take either BIOL2220 Principles of biochemistry or BIOC2600 Basic biochemistry as a replacement, both BIOL2220 and BIOC2600 are mutually exclusive.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Biological Sciences (Intensive)

Offered to students 2020

admitted to Year 1 in

Objectives:

This major is designed for students seeking a broad-based training in conventional and modern biology. Students are guided in a stimulating learning environment to explore major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The curriculum allows students to select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further exposed to three fundamental areas of biological sciences (genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology). Students are engaged in scientific learning through a wide range of laboratory and field work. They will acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major prepares graduates for employment as professionals in a variety of careers or for postgraduate study. The intensive major includes additional coursework and a compulsory capstone research project. It is designed for students with a strong desire to acquire knowledge with sufficient depth and breadth in biological sciences.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and explain the key concepts in genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology, and to appraise the related ethical and moral issues (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 2: equip with sufficient knowledge in chemistry for application within a biological context (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 3: analyze and interpret quantitative and qualitative biological data to provide scientifically based conclusions and/or judgements (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 4: tackle biological research problems by formulating hypothesis and designing experimental investigations (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 5: communicate effectively and professionally with scientists, educators, media, and general public in oral and written forms (by means of coursework, laboratory- and/or research-based learning, and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

Major in Ecology & Biodiversity

Major in Ecology & Biodiversity (Intensive)

Major in Molecular Biology & Biotechnology

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (144 credits)

Required courses	Required Courses (144 Credits)				
1. Introductory lev	el courses (60 credits)				
Disciplinary Core	Courses: Science Foundation Courses (12 credits)				
SCNC1111	Scientific method and reasoning (6)	(Note 1)			
SCNC1112	Fundamentals of modern science (6)	(Note 1)			
Disciplinary Core	Courses (48 credits)				
BIOL1110	From molecules to cells (6)	(Note 1)			
BIOL1309	Evolutionary diversity (6)	(Note 1)			
CHEM1042	General chemistry I (6)				
CHEM1043	General chemistry II (6)				
BIOL2102	Biostatistics (6)	(Note 1)			
BIOL2103	Biological sciences laboratory course (6)	(Note 1)			
BIOL2220	Principles of biochemistry (6)	Take either BIOL2220 or BIOC2600 to fulfill this 48 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1)			
BIOL2306	Ecology and evolution (6)	(Note 1)			
BIOC2600	Basic biochemistry (6)	Take either BIOL2220 or BIOC2600 to fulfill this 48 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1)			
2 Advanced level	courses (72 eredite)				

2. Advanced level courses (72 credits)

Disciplinary Electives (72 credits with at least 18 credits of Level 4XXX courses))

(A) Gen	etics.	molecular and	cell biology (at least 12 credits selected from area A	1)

BIOL3401 Molecular biology (6)
BIOL3402 Cell biology and cell technology (6)
BIOL3404 Protein structure and function (6)
BIOL3408 Genetics (6)
BIOL4416 Stem cells and regenerative biology (6)

BIOL4417 'Omics' and systems biology (6)
(B) Ecology, systematics and evolution (at least 12 credits selected from area B)

BIOL3301 Marine biology (6)

BIOL3302 Systematics and phylogenetics (6) BIOL3303 Conservation biology (6)

BIOL3319	Tropical terrestrial ecology (6)
BIOL3506	Evolutionary biology (6)
BIOL4302	Environmental impact assessment (6)
	d organismic biology (at least 18 credits with 6 credits from each of List I, II & III)
List I	d organismic bloogy (at least to creats with a creats from each of List i, ii a iii)
BIOL3101	Animal behaviour (6)
BIOL3105	Animal physiology and environmental adaptation (6)
BIOL3205	Human physiology (6)
BIOL3403	Immunology (6)
BIOL3406	Reproduction and reproductive biotechnology (6)
BIOL3503	Endocrinology: human physiology II (6)
List II	
BIOL3314	Plant structure and evolution (6)
ENVS3202	Plant physiology and climate change (6)
BIOL4411	Plant and food biotechnology (6)
List III	
BIOL3109	Environmental microbiology (6)
BIOL3203	Food microbiology (6)
BIOL3508	Microbial physiology and biotechnology (6)
BIOL4401	Medical microbiology and applied immunology (6)
3. Capstone requir	rement (12 credits)
BIOL4994	Biological sciences project (12)

- 1. These are core courses in the regular Biological Sciences Major (96 credits) curriculum.
- 2. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC11111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE) Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Major Title Major in Biological Sciences (Intensive)

Offered to students 2019

admitted to Year 1 in

Objectives:

This major is designed for students seeking a broad-based training in conventional and modern biology. Students are guided in a stimulating learning environment to explore major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The curriculum allows students to select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further exposed to three fundamental areas of biological sciences (genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology). Students are engaged in scientific learning through a wide range of laboratory and field work. They will acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major prepares graduates for employment as professionals in a variety of careers or for postgraduate study. The intensive major includes additional coursework and a compulsory capstone research project. It is designed for students with a strong desire to acquire knowledge with sufficient depth and breadth in biological sciences.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and explain the key concepts in genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology, and to appraise the related ethical and moral issues (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 2: equip with sufficient knowledge in chemistry for application within a biological context (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 3: analyze and interpret quantitative and qualitative biological data to provide scientifically based conclusions and/or judgements (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 4: tackle biological research problems by formulating hypothesis and designing experimental investigations (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 5: communicate effectively and professionally with scientists, educators, media, and general public in oral and written forms (by means of coursework, laboratory- and/or research-based learning, and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

Major in Ecology & Biodiversity

Major in Ecology & Biodiversity (Intensive)

Major in Molecular Biology & Biotechnology

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (144 credits)

Required courses	s (144 credits)	
1. Introductory lev	rel courses (60 credits)	
Disciplinary Core	Courses: Science Foundation Courses (12 credits)	
SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core	Courses (48 credits)	
BIOL1110	From molecules to cells (6)	(Note 1)
BIOL1309	Evolutionary diversity (6)	(Note 1)
CHEM1042	General chemistry I (6)	
CHEM1043	General chemistry II (6)	
BIOL2102	Biostatistics (6)	(Note 1)
BIOL2103	Biological sciences laboratory course (6)	(Note 1)
BIOL2220	Principles of biochemistry (6)	Take either BIOL2220 or BIOC2600 to fulfill this 48 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1)
BIOL2306	Ecology and evolution (6)	(Note 1)
BIOC2600	Basic biochemistry (6)	Take either BIOL2220 or BIOC2600 to fulfill this 48 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1)
2 Advanced level	courses (72 credits)	

2. Advanced level courses (72 credits)

Disciplinary Electives (72 credits with at least 18 credits of Level 4XXX courses)

(A) Genetics,	molecular and	cel	l biol	ogy (a	it least 12	2 credits	selected	trom	area A	ı)

BIOL3401 Molecular biology (6)
BIOL3402 Cell biology and cell technology (6)
BIOL3404 Protein structure and function (6)
BIOL3408 Genetics (6)
BIOL4416 Stem cells and regenerative biology (6)

BIOL4417 'Omics' and systems biology (6)

(B) Ecology, systematics and evolution (at least 12 credits selected from area B)

BIOL3101 Animal behaviour (6)
BIOL3301 Marine biology (6)

BIOL3302 Systematics and phylogenetics (6)

BIOL3303	Conservation biology (6)	
BIOL3319	Tropical terrestrial ecology (6)	
BIOL3506	Evolutionary biology (6)	
BIOL4302	Environmental impact assessment (6)	
(C) Physiology an	d organismic biology (at least 18 credits with 6 credi	ts from each of List I, II & III)
List I		
BIOL3105	Animal physiology and environmental adaptation (6)	
BIOL3205	Human physiology (6)	
BIOL3403	Immunology (6)	
BIOL3406	Reproduction and reproductive biotechnology (6)	
BIOL3503	Endocrinology: human physiology II (6)	
List II		
BIOL3107	Plant physiology (6)	Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL3314	Plant structure and evolution (6)	
ENV\$3202	Plant physiology and climate change (6)	Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL4411	Plant and food biotechnology (6)	
List III	, ,	
BIOL3109	Environmental microbiology (6)	
BIOL3203	Food microbiology (6)	
BIOL3508	Microbial physiology and biotechnology (6)	
BIOL4401	Medical microbiology and applied immunology (6)	
3. Capstone requi	rement (12 credits)	
BIOL4994	Biological sciences project (12)	
2.02.00	. , , ,	

Notes:

1. These are core courses in the regular Biological Sciences Major (96 credits) curriculum.

Remarks:

Major Title Major in Biological Sciences (Intensive)

Offered to students 2018

admitted to Year 1 in

Objectives:

This major is designed for students seeking a broad-based training in conventional and modern biology. Students are guided in a stimulating learning environment to explore major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The curriculum allows students to select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further exposed to three fundamental areas of biological sciences (genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology). Students are engaged in scientific learning through a wide range of laboratory and field work. They will acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major prepares graduates for employment as professionals in a variety of careers or for postgraduate study. The intensive major includes additional coursework and a compulsory capstone research project. It is designed for students with a strong desire to acquire knowledge with sufficient depth and breadth in biological sciences.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and explain the key concepts in genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology, and to appraise the related ethical and moral issues (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 2: equip with sufficient knowledge in chemistry for application within a biological context (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 3: analyze and interpret quantitative and qualitative biological data to provide scientifically based conclusions and/or judgements (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 4: tackle biological research problems by formulating hypothesis and designing experimental investigations (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 5: communicate effectively and professionally with scientists, educators, media, and general public in oral and written forms (by means of coursework, laboratory- and/or research-based learning, and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

Major in Ecology & Biodiversity

Major in Ecology & Biodiversity (Intensive)

Major in Molecular Biology & Biotechnology

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (144 credits)

Required courses	s (144 creatts)	
1. Introductory lev	rel courses (60 credits)	
Disciplinary Core	Courses: Science Foundation Courses (12 credits)	
SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core	Courses (48 credits)	
BIOL1110	From molecules to cells (6)	(Note 1)
BIOL1309	Evolutionary diversity (6)	(Note 1)
CHEM1042	General chemistry I (6)	
CHEM1043	General chemistry II (6)	
BIOL2102	Biostatistics (6)	(Note 1)
BIOL2103	Biological sciences laboratory course (6)	(Note 1)
BIOL2220	Principles of biochemistry (6)	Take either BIOL2220 or BIOC2600 to fulfill this 48 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1)
BIOL2306	Ecology and evolution (6)	(Note 1)
BIOC2600	Basic biochemistry (6)	Take either BIOL2220 or BIOC2600 to fulfill this 48 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1)
2 Advanced level	courses (72 credits)	

2. Advanced level courses (72 credits)

Disciplinary Electives (72 credits with at least 18 credits of Level 4XXX courses)

(A	A) Gene	etics.	molecular and	cell biology (at least 12 credits selected from area A)

BIOL3401 Molecular biology (6)
BIOL3402 Cell biology and cell technology (6)
BIOL3404 Protein structure and function (6)
BIOL3408 Genetics (6)
BIOL4416 Stem cells and regenerative biology (6)

BIOL4417 'Omics' and systems biology (6)
(B) Ecology, systematics and evolution (at least 12 credits selected from area B)

BIOL3101 Animal behaviour (6)
BIOL3301 Marine biology (6)

BIOL3302 Systematics and phylogenetics (6)

	0 (1) (1)	
BIOL3303	Conservation biology (6)	
BIOL3319	Tropical terrestrial ecology (6)	
BIOL3506	Evolutionary biology (6)	
BIOL4302	Environmental impact assessment (6)	
(C) Physiology an	d organismic biology (at least 18 credits with 6 credi	ts from each of List I, II & III)
List I		
BIOL3105	Animal physiology and environmental adaptation (6)	
BIOL3205	Human physiology (6)	
BIOL3403	Immunology (6)	
BIOL3406	Reproduction and reproductive biotechnology (6)	
BIOL3503	Endocrinology: human physiology II (6)	
List II		
BIOL3107	Plant physiology (6)	Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL3314	Plant structure and evolution (6)	
ENVS3202	Plant physiology and climate change (6)	Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL4411	Plant and food biotechnology (6)	
List III		
BIOL3109	Environmental microbiology (6)	
BIOL3203	Food microbiology (6)	
BIOL3508	Microbial physiology and biotechnology (6)	
BIOL4401	Medical microbiology and applied immunology (6)	
3. Capstone requi	rement (12 credits)	
BIOL4994	Biological sciences project (12)	

Notes:

1. These are core courses in the regular Biological Sciences Major (96 credits) curriculum.

Remarks:

Major Title Major in Biological Sciences (Intensive) 2017

Offered to students

admitted to Year 1 in

Objectives:

This major is designed for students seeking a broad-based training in conventional and modern biology. Students are guided in a stimulating learning environment to explore major biological systems at different levels of biological organization. Teaching emphasizes both core concepts and applied aspects in biological sciences. The curriculum allows students to select courses according to their own interests from a wide spectrum of elective courses. At the advanced level, students are further exposed to three fundamental areas of biological sciences (genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology). Students are engaged in scientific learning through a wide range of laboratory and field work. They will acquire valuable transferable skills in analysis, organization and communication. The Biological Sciences Major prepares graduates for employment as professionals in a variety of careers or for postgraduate study. The intensive major includes additional coursework and a compulsory capstone research project. It is designed for students with a strong desire to acquire knowledge with sufficient depth and breadth in biological sciences.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and explain the key concepts in genetics, molecular & cell biology; ecology, systematics and evolution; physiology and organismic biology, and to appraise the related ethical and moral issues (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 2: equip with sufficient knowledge in chemistry for application within a biological context (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 3: analyze and interpret quantitative and qualitative biological data to provide scientifically based conclusions and/or judgements (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 4: tackle biological research problems by formulating hypothesis and designing experimental investigations (by means of coursework, laboratory- and/or research-based learning in the curriculum)
- PLO 5: communicate effectively and professionally with scientists, educators, media, and general public in oral and written forms (by means of coursework, laboratory- and/or research-based learning, and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

Major in Ecology & Biodiversity

Major in Ecology & Biodiversity (Intensive)

Major in Molecular Biology & Biotechnology

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (144 credits)

Required courses	5 (144 Credits)	
1. Introductory lev	rel courses (60 credits)	
Disciplinary Core	Courses: Science Foundation Courses (12 credits)	
SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core	Courses (48 credits)	
BIOL1110	From molecules to cells (6)	(Note 1)
BIOL1309	Evolutionary diversity (6)	(Note 1)
CHEM1042	General chemistry I (6)	
CHEM1043	General chemistry II (6)	
BIOL2102	Biostatistics (6)	(Note 1)
BIOL2103	Biological sciences laboratory course (6)	(Note 1)
BIOL2220	Principles of biochemistry (6)	Take either BIOL2220 or BIOC2600 to fulfill this 48 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1)
BIOL2306	Ecology and evolution (6)	(Note 1)
BIOC2600	Basic biochemistry (6)	Take either BIOL2220 or BIOC2600 to fulfill this 48 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1)
2 Advanced level	courses (72 eredite)	

2. Advanced level courses (72 credits)

Disciplinary Electives (72 credits with at least 18 credits of Level 4XXX courses)

(A	A) Gene	etics.	molecular and	cell biology (at least 12 credits selected from area A)

BIOL3401 Molecular biology (6) BIOL3402 Cell biology and cell technology (6) BIOL3404 Protein structure and function (6) **BIOL3408** Genetics (6) Stem cells and regenerative biology (6) **BIOL4416**

BIOL4417 'Omics' and systems biology (6) (B) Ecology, systematics and evolution (at least 12 credits selected from area B)

Animal behaviour (6) BIOL3101 Marine biology (6) BIOL3301

BIOL3302 Systematics and phylogenetics (6)

BIOL 2222	Companyation biology (6)	
BIOL3303	Conservation biology (6)	
BIOL3319	Tropical terrestrial ecology (6)	
BIOL3506	Evolutionary biology (6)	
BIOL4302	Environmental impact assessment (6)	
` ' ' ' '	d organismic biology (at least 18 credits with 6 credit	s from each of List I, II & III)
List I		
BIOL3105	Animal physiology and environmental adaptation (6)	
BIOL3205	Human physiology (6)	
BIOL3403	Immunology (6)	
BIOL3406	Reproduction and reproductive biotechnology (6)	
BIOL3503	Endocrinology: human physiology II (6)	
List II		
BIOL3107	Plant physiology (6)	Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL3314	Plant structure and evolution (6)	
ENVS3202	Plant physiology and climate change (6)	Take either BIOL3107 or ENVS3202 to fulfill this 6 credits requirement in List II, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL4411	Plant and food biotechnology (6)	
List III	3, ()	
BIOL3109	Environmental microbiology (6)	
BIOL3203	Food microbiology (6)	
BIOL3508	Microbial physiology and biotechnology (6)	
BIOL4401	Medical microbiology and applied immunology (6)	
3. Capstone require	6, 11	
BIOL4994	Biological sciences project (12)	

Notes:

1. These are core courses in the regular Biological Sciences Major (96 credits) curriculum.

Remarks:

Offered to students 2020

admitted to Year 1 in

Objectives:

The Major in Chemistry aims to provide students with a solid training in major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. A wide selection of elective courses in chemical biology, chemical analysis, computational chemistry, environmental chemistry, industrial chemistry, interfacial science, material, and medicinal chemistry, is also available to provide students with knowledge and training to help them meet the dynamic and ever-changing challenges in science and technology. Graduates of the Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences that are crucial for their future careers in a knowledge-based economy. It is expected that our graduates will be able to meet local and regional requirements in the industrial, commercial, government or education sectors and will become future leaders of these sectors.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 2: demonstrate an in-depth understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical & practical problems (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 3: have developed an awareness & understanding of scientific and ethical issues where chemistry relates to other disciplines, and an appreciation of the impact of chemistry in the modern world (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 4: have substantially developed advanced experimental skills including chemical synthesis, analysis & operation of modern instrumentation, and data analysis skills with the ability to interpret experimental information & infer appropriate conclusions (by requiring of no less than 100 hours of laboratory classes in the curriculum)
- PLO 5: demonstrate problem-solving skills, critical thinking, creativity & effective written & oral communication skills, and to co-operate with other people & participate as an effective team member (by means of coursework, laboratory-based learning, group project & presentation opportunities in the curriculum)
- PLO 6: gain experience in working in the real-life industrial or research environment, and enhance their initiative, interpersonal skills, time management skills & project organization skills (by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistry-related companies or research laboratories)

Impermissible Combinations:

Major in Chemistry (Intensive)

Minor in Chemistry

Required courses (96 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)
SCNC1111 Scientific method and reasoning (6)
SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

CHEM1042 General chemistry I (6)
CHEM1043 General chemistry II (6)
CHEM2241 Analytical chemistry I (6)
CHEM2341 Inorganic chemistry I (6)
CHEM2441 Organic chemistry I (6)

CHEM2541 Introductory physical chemistry (6)

2. Advanced level courses (42 credits)

Disciplinary Core Course (30 credits)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3341 Inorganic chemistry II (6)
CHEM3441 Organic chemistry II (6)
CHEM3443 Organic chemistry laboratory (6)

CHEM3541 Physical chemistry: Introduction to quantum chemistry (6)

Disciplinary Electives (12 credits)

At least 12 credits of any level 4 Chemistry (CHEM4XXX) courses. The current list include courses in List A.

List A

CHEM4142 Symmetry, group theory and applications (6)
CHEM4143 Interfacial science and technology (6)
CHEM4144 Advanced materials (6)

CHEM4144 Advanced materials (6)
CHEM4145 Medicinal chemistry (6)
CHEM4147 Supramolecular chemistry (6)

CHEM4148 Frontiers in Modern Chemical Science (6)

CHEM4241 Modern chemical instrumentation and applications (6)
CHEM4242 Analytical chemistry (6)

CHEM4242 Analytical criefficity (6)
CHEM4341 Advanced inorganic chemistry (6)
CHEM4342 Organometallic chemistry (6)
CHEM4441 Advanced organic chemistry (6)

CHEM4443 Integrated organic synthesis (6)

CHEM4444 Chemical biology (6)

CHEM4542 Computational chemistry (6)
CHEM4543 Advanced physical chemistry (6)

CHEM4544 Electrochemical science and technology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

CHEM3999 Directed studies in chemistry (6)
CHEM4910 Chemistry literacy and research (6)

CHEM4911 Capstone experience for chemistry undergraduates: HKUtopia

(6)

CHEM4966 Chemistry internship (6) CHEM4999 Chemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.
- 5. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Offered to students 2019

admitted to Year 1 in

Objectives:

The Major in Chemistry aims to provide students with a solid training in major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. A wide selection of elective courses in chemical biology, chemical analysis, computational chemistry, environmental chemistry, industrial chemistry, interfacial science, material, and medicinal chemistry, is also available to provide students with knowledge and training to help them meet the dynamic and ever-changing challenges in science and technology. Graduates of the Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences that are crucial for their future careers in a knowledge-based economy. It is expected that our graduates will be able to meet local and regional requirements in the industrial, commercial, government or education sectors and will become future leaders of these sectors.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 2: demonstrate an in-depth understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical & practical problems (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 3: have developed an awareness & understanding of scientific and ethical issues where chemistry relates to other disciplines, and an appreciation of the impact of chemistry in the modern world (by means of coursework, laboratorybased and/or research-based learning in the curriculum)
- PLO 4: have substantially developed advanced experimental skills including chemical synthesis, analysis & operation of modern instrumentation, and data analysis skills with the ability to interpret experimental information & infer appropriate conclusions (by requiring of no less than 100 hours of laboratory classes in the curriculum)
- PLO 5: demonstrate problem-solving skills, critical thinking, creativity & effective written & oral communication skills, and to co-operate with other people & participate as an effective team member (by means of coursework, laboratory-based learning, group project & presentation opportunities in the curriculum)
- PLO 6: gain experience in working in the real-life industrial or research environment, and enhance their initiative, interpersonal skills, time management skills & project organization skills (by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistry-related companies or research laboratories)

Impermissible Combinations:

Major in Chemistry (Intensive)

Minor in Chemistry

Required courses (96 credits)

1. Introductory level courses (48 credits)
--

Disciplinary Core Courses: Science Foundation Courses (12 credits) Scientific method and reasoning (6) SCNC1111 **SCNC1112** Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

General chemistry I (6) CHEM1042 General chemistry II (6) CHEM1043 CHEM2241 Analytical chemistry I (6) CHEM2341 Inorganic chemistry I (6) CHFM2441 Organic chemistry I (6) Introductory physical chemistry (6) CHEM2541

2. Advanced level courses (42 credits)

Disciplinary Core Course (30 credits)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3341 Inorganic chemistry II (6) Organic chemistry II (6) CHEM3441 CHEM3443 Organic chemistry laboratory (6)

Physical chemistry: Introduction to quantum chemistry (6) CHEM3541

Disciplinary Electives (12 credits)

At least 12 credits of any level 4 Chemistry (CHEM4XXX) courses. The current list include courses in List A. List A

CHEM4142

Symmetry, group theory and applications (6) CHFM4143 Interfacial science and technology (6)

CHEM4144 Advanced materials (6) CHEM4145 Medicinal chemistry (6) Supramolecular chemistry (6) CHEM4147

CHEM4148 Frontiers in Modern Chemical Science (6)

Modern chemical instrumentation and applications (6) CHEM4241

CHEM4242 Analytical chemistry (6) Advanced inorganic chemistry (6) CHEM4341 Organometallic chemistry (6) CHEM4342 CHEM4441 Advanced organic chemistry (6)

CHEM4443 Integrated organic synthesis (6)

CHEM4444 Chemical biology (6)

CHEM4542 Computational chemistry (6)
CHEM4543 Advanced physical chemistry (6)

CHEM4544 Electrochemical science and technology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

CHEM3999 Directed studies in chemistry (6)
CHEM4910 Chemistry literacy and research (6)

CHEM4911 Capstone experience for chemistry undergraduates: HKUtopia

(6)

CHEM4966 Chemistry internship (6) CHEM4999 Chemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks:

Offered to students 2018

admitted to Year 1 in

Objectives:

The Major in Chemistry aims to provide students with a solid training in major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. A wide selection of elective courses in chemical biology, chemical analysis, computational chemistry, environmental chemistry, industrial chemistry, interfacial science, material, and medicinal chemistry, is also available to provide students with knowledge and training to help them meet the dynamic and ever-changing challenges in science and technology. Graduates of the Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences that are crucial for their future careers in a knowledge-based economy. It is expected that our graduates will be able to meet local and regional requirements in the industrial, commercial, government or education sectors and will become future leaders of these sectors.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 2: demonstrate an in-depth understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical & practical problems (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
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Impermissible Combinations:

Major in Chemistry (Intensive)

Minor in Chemistry

Required courses (96 credits)

1. Introductory	level courses	(48 credits)
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Disciplinary Core Courses: Science Foundation Courses (12 credits)
SCNC1111 Scientific method and reasoning (6)
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Disciplinary Core Courses (36 credits)

CHEM1042 General chemistry I (6)
CHEM1043 General chemistry II (6)
CHEM2241 Analytical chemistry I (6)
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CHEM2441 Organic chemistry I (6)
CHEM2541 Introductory physical chemistry (6)

2. Advanced level courses (42 credits)

Disciplinary Core Course (30 credits)

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CHEM3341 Inorganic chemistry II (6)
CHEM3441 Organic chemistry II (6)
CHEM3443 Organic chemistry laboratory (6)

CHEM3541 Physical chemistry: Introduction to quantum chemistry (6)

Disciplinary Electives (12 credits)

At least 12 credits of any level 4 Chemistry (CHEM4XXX) courses. The current list include courses in List A. List A

CHEM4142 Symmetry, group theory and applications (6)
CHEM4143 Interfacial science and technology (6)

Advanced materials (6)

CHEM4144 Advanced materials (6)
CHEM4145 Medicinal chemistry (6)
CHEM4147 Supramolecular chemistry (6)

CHEM4148 Frontiers in Modern Chemical Science (6)

CHEM4241 Modern chemical instrumentation and applications (6)

CHEM4242 Analytical chemistry (6)
CHEM4341 Advanced inorganic chemistry (6)
CHEM4342 Organometallic chemistry (6)
CHEM4441 Advanced organic chemistry (6)

CHEM4443 Integrated organic synthesis (6)

CHEM4444 Chemical biology (6)

CHEM4542 Computational chemistry (6)
CHEM4543 Advanced physical chemistry (6)

CHEM4544 Electrochemical science and technology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

CHEM3999 Directed studies in chemistry (6)
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Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks:

Offered to students 2017

admitted to Year 1 in

Objectives:

The Major in Chemistry aims to provide students with a solid training in major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. A wide selection of elective courses in chemical biology, chemical analysis, computational chemistry, environmental chemistry, industrial chemistry, interfacial science, material, and medicinal chemistry, is also available to provide students with knowledge and training to help them meet the dynamic and ever-changing challenges in science and technology. Graduates of the Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences that are crucial for their future careers in a knowledge-based economy. It is expected that our graduates will be able to meet local and regional requirements in the industrial, commercial, government or education sectors and will become future leaders of these sectors.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
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Impermissible Combinations:

Major in Chemistry (Intensive)

Minor in Chemistry

Required courses (96 credits)

1. Introductory	level courses	(48 creaits)	
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Disciplinary Core Courses: Science Foundation Courses (12 credits)
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Disciplinary Core Course (30 credits)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

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CHEM3541 Physical chemistry: Introduction to quantum chemistry (6)

Disciplinary Electives (12 credits)

At least 12 credits of any level 4 Chemistry (CHEM4XXX) courses. The current list include courses in List A.

List A

CHEM4142 Symmetry, group theory and applications (6)
CHEM4143 Interfacial science and technology (6)
CHEM4144 Advanced materials (6)

CHEM4145 Medicinal chemistry (6)
CHEM4147 Supramolecular chemistry (6)

CHEM4148 Frontiers in Modern Chemical Science (6)

CHEM4241 Modern chemical instrumentation and applications (6)

CHEM4242 Analytical chemistry (6)
CHEM4341 Advanced inorganic chemistry (6)
CHEM4342 Organometallic chemistry (6)
CHEM4441 Advanced organic chemistry (6)

CHEM4443 Integrated organic synthesis (6)

CHEM4444 Chemical biology (6)

CHEM4542 Computational chemistry (6)
CHEM4543 Advanced physical chemistry (6)

CHEM4544 Electrochemical science and technology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

CHEM3999 Directed studies in chemistry (6)
CHEM4910 Chemistry literacy and research (6)

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Remarks:

Offered to students 2016

admitted to Year 1 in

Objectives:

The Major in Chemistry aims to provide students with a solid training in major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. A wide selection of elective courses in chemical biology, chemical analysis, computational chemistry, environmental chemistry, industrial chemistry, interfacial science, material, and medicinal chemistry, is also available to provide students with knowledge and training to help them meet the dynamic and ever-changing challenges in science and technology. Graduates of the Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences that are crucial for their future careers in a knowledge-based economy. It is expected that our graduates will be able to meet local and regional requirements in the industrial, commercial, government or education sectors and will become future leaders of these sectors.

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By the end of this programme, students should be able to:

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Impermissible Combinations:

Major in Chemistry (Intensive)

Minor in Chemistry

Required courses (96 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)
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Disciplinary Core Courses (36 credits)

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CHEM1043 General chemistry II (6)
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CHEM2341 Inorganic chemistry I (6)
CHEM2441 Organic chemistry I (6)
CHEM2541 Introductory physical chemistry (6)

2. Advanced level courses (42 credits)

Disciplinary Core Course (30 credits)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3341 Inorganic chemistry II (6)
CHEM3441 Organic chemistry II (6)
CHEM3443 Organic chemistry laboratory (6)

CHEM3541 Physical chemistry: Introduction to quantum chemistry (6)

Disciplinary Electives (12 credits)

At least 12 credits of any level 4 Chemistry (CHEM4XXX) courses. The current list include courses in List A. List A

CHEM4142 Symmetry, group theory and applications (6)
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CHEM4144 Advanced materials (6)
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CHEM4148 Frontiers in Modern Chemical Science (6)

CHEM4241 Modern chemical instrumentation and applications (6)

CHEM4242 Analytical chemistry (6)
CHEM4341 Advanced inorganic chemistry (6)
CHEM4342 Organometallic chemistry (6)
CHEM4441 Advanced organic chemistry (6)

CHEM4443 Integrated organic synthesis (6)

CHEM4444 Chemical biology (6)

CHEM4542 Computational chemistry (6)
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At least 6 credits selected from the following courses:

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Remarks:

Offered to students 2015

admitted to Year 1 in

Objectives:

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Impermissible Combinations:

Major in Chemistry (Intensive)

Minor in Chemistry

Required courses (96 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)
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3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

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Remarks:

Offered to students 2014

admitted to Year 1 in

Objectives:

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Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 2: demonstrate an in-depth understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical & practical problems (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 3: have developed an awareness & understanding of scientific and ethical issues where chemistry relates to other disciplines, and an appreciation of the impact of chemistry in the modern world (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 4: have substantially developed advanced experimental skills including chemical synthesis, analysis & operation of modern instrumentation, and data analysis skills with the ability to interpret experimental information & infer appropriate conclusions (by requiring of no less than 100 hours of laboratory classes in the curriculum)
- PLO 5: demonstrate problem-solving skills, critical thinking, creativity & effective written & oral communication skills, and to co-operate with other people & participate as an effective team member (by means of coursework, laboratory-based learning, group project & presentation opportunities in the curriculum)
- PLO 6: gain experience in working in the real-life industrial or research environment, and enhance their initiative, interpersonal skills, time management skills & project organization skills (by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistry-related companies or research laboratories)

Impermissible Combinations:

Minor in Chemistry

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

CHEM1042 General chemistry I (6) [previous title: General chemistry (6)]

CHEM2241 Analytical chemistry I (6)
CHEM2341 Inorganic chemistry I (6)
CHEM2441 Organic chemistry I (6)

CHEM2541 Introductory physical chemistry (6) [previous title: Physical chemistry I (6)]

2. Advanced level courses (48 credits)

Disciplinary Core Course (30 credits)

CHEM3146 Principles and applications of spectroscopic and analytical techniques (6)

Analytical chemistry II: chemical instrumentation (6)
Inorganic chemistry II (6)

CHEM3341 Inorganic chemistry II (6)
CHEM3441 Organic chemistry II (6)

CHEM3541 Physical chemistry: Introduction to quantum [previous title: Physical chemistry II: Introduction to

chemistry (6) quantum chemistry (6)]

Disciplinary Electives (12 credits)

At least 12 credits selected from the following 18 credits of courses in two different areas in List A:

List A

CHEM3241

CHEM3542 Physical chemistry: statistical

thermodynamics and kinetics theory (6)
CHEM4341 Advanced inorganic chemistry (6)
CHEM4441 Advanced organic chemistry (6)

Advanced organic chemistry (6) Take either CHEM4443 or CHEM4441 to fulfill this 12

credits requirement, but not both.

CHEM4443 Integrated organic synthesis (6) Take either CHEM4443 or CHEM4441 to fulfill this 12

credits requirement, but not both.

Disciplinary Electives (6 credits)

At least 6 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level, excluding CHEM3999 Directed studies in chemistry, CHEM4910 Chemistry literacy and research, CHEM4911 Capstone experience for chemistry undergraduates: HKUtopia, CHEM4966 Chemistry internship and CHEM4999 Chemistry project), subject to pre-requisite requirements. The current list inlcude courses in List B and those course not selected to fulfill the requirements in List A.

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CHEM3142 Chemical process industries and analysis (6)
CHEM3143 Introduction to materials chemistry (6)

CHEM3143 Introduction to materials chemistry CHEM3242 Food and water analysis (6)

CHEM3242 Food and water analysis (6) CHEM3342 Bioinorganic chemistry (6)

CHEM3442 Organic chemistry of biomolecules (6)
CHEM3443 Organic chemistry laboratory (6)

CHEM3445 Integrated laboratory (6)

CHEM4142 Symmetry, group theory and applications (6) CHEM4143 Interfacial science and technology (6)

CHEM4144 Advanced materials (6)
CHEM4145 Medicinal chemistry (6)
CHEM4147 Supramolecular chemistry (6)

CHEM4148 Frontiers in Modern Chemical Science (6)

CHEM4241 Modern chemical instrumentation and

applications (6)
CHEM4242
CHEM4342
CHEM4444
Chemical biology (6)
CHEM4542
CHEM4542
CHEM4543
Advanced physical chemistry (6)

CHEM4544 Electrochemical science and technology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

CHEM3999 Directed studies in chemistry (6)
CHEM4910 Chemistry literacy and research (6)
CHEM4911 Capstone experience for chemistry

undergraduates: HKUtopia (6) Chemistry internship (6)

CHEM4966 Chemistry internship (6 CHEM4999 Chemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.
- 6. CHEM3146 Principles and applications of spectroscopic and analytical techniques is not offered from 2016-17. Students should consult the course selection advisers for course replacement.

Remarks:

Offered to students 2013

admitted to Year 1 in

Objectives:

The Major in Chemistry aims to provide students with a solid training in major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. A wide selection of elective courses in chemical biology, chemical analysis, computational chemistry, environmental chemistry, industrial chemistry, interfacial science, material, and medicinal chemistry, is also available to provide students with knowledge and training to help them meet the dynamic and ever-changing challenges in science and technology. Graduates of the Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences that are crucial for their future careers in a knowledge-based economy. It is expected that our graduates will be able to meet local and regional requirements in the industrial, commercial, government or education sectors and will become future leaders of these sectors.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 2: demonstrate an in-depth understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical & practical problems (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 3: have developed an awareness & understanding of scientific and ethical issues where chemistry relates to other disciplines, and an appreciation of the impact of chemistry in the modern world (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 4: have substantially developed advanced experimental skills including chemical synthesis, analysis & operation of modern instrumentation, and data analysis skills with the ability to interpret experimental information & infer appropriate conclusions (by requiring of no less than 100 hours of laboratory classes in the curriculum)
- PLO 5: demonstrate problem-solving skills, critical thinking, creativity & effective written & oral communication skills, and to co-operate with other people & participate as an effective team member (by means of coursework, laboratory-based learning, group project & presentation opportunities in the curriculum)
- PLO 6: gain experience in working in the real-life industrial or research environment, and enhance their initiative, interpersonal skills, time management skills & project organization skills (by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistry-related companies or research laboratories)

Impermissible Combinations:

Minor in Chemistry

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

CHEM1042 General chemistry I (6) [previous title: General chemistry (6)]

CHEM2241 Analytical chemistry I (6)
CHEM2341 Inorganic chemistry I (6)
CHEM2441 Organic chemistry I (6)

CHEM2541 Introductory physical chemistry (6) [previous title: Physical chemistry I (6)]

2. Advanced level courses (48 credits) Disciplinary Core Courses (30 credits)

CHEM3146 Principles and applications of spectroscopic and analytical techniques (6)

Analytical chemistry II: chemical instrumentation (6)
Inorganic chemistry II (6)

CHEM3441 Organic chemistry II (6)
CHEM3541 Physical chemistry: Introduction to quantum

Physical chemistry: Introduction to quantum [previous title: Physical chemistry II: Introduction to

chemistry (6) quantum chemistry (6)]

Disciplinary Electives (12 credits)

At least 12 credits selected from the following 18 credits of courses in two different areas in List A:

List A

CHEM3241

CHEM3341

CHEM4541

CHEM3542 Physical chemistry: statistical thermodynamics and kinetics theory (6)
CHEM4341 Advanced inorganic chemistry (6)
CHEM4441 Advanced organic chemistry (6)

Take either CHEM3542 or CHEM4541 to fulfill this 12 credits requirement, but not both.

Take either CHEM4443 or CHEM4441 to fulfill this 12 credits requirement. but not both.

CHEM4443 Integrated organic synthesis (6)

Take either CHEM4443 or CHEM4441 to fulfill this 12

credits requirement, but not both.
Physical chemistry III: statistical

Credits requirement, but not both.

Take either CHEM3542 or CHEM4541 to fulfill this 12

credits requirement, but not both.

thermodynamics and kinetics theory (6) **Disciplinary Electives (6 credits)** At least 6 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level, excluding CHEM3999 Directed studies in chemistry, CHEM4910 Chemistry literacy and research, CHEM4911 Capstone experience for chemistry undergraduates: HKUtopia, CHEM4966 Chemistry internship and CHEM4999 Chemistry project), subject to pre-requisite requirements. The current list inlcude courses in List B and those courses not selected to fulfill the requirements in List A.

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CHEM3141	Environmental chemistry (6)
CHEWS 141	Liviloilileitai cileilisti y (0)

CHEM3142 Chemical process industries and analysis (6) CHEM3143 Introduction to materials chemistry (6)

CHEM3242 Food and water analysis (6) CHEM3342 Bioinorganic chemistry (6)

CHEM3442 Organic chemistry of biomolecules (6)
CHEM3443 Organic chemistry laboratory (6)

CHEM3445 Integrated laboratory (6)

CHEM4142 Symmetry, group theory and applications (6) CHEM4143 Interfacial science and technology (6)

CHEM4144 Advanced materials (6)
CHEM4145 Medicinal chemistry (6)
CHEM4147 Supramolecular chemistry (6)

CHEM4148 Frontiers in Modern Chemical Science (6)
CHEM4241 Modern chemical instrumentation and

M4241 Modern chemical instrumentation applications (6)

CHEM4242 Analytical chemistry (6)
CHEM4342 Organometallic chemistry (6)
CHEM4444 Chemical biology (6)
CHEM4542 Computational chemistry (6)
CHEM4543 Advanced physical chemistry (6)

CHEM4544 Electrochemical science and technology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

CHEM3999 Directed studies in chemistry (6)
CHEM4910 Chemistry literacy and research (6)
CHEM4911 Capstone experience for chemistry undergraduates: HKUtopia (6)

CHEM4966 Chemistry internship (6) CHEM4999 Chemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.
- 6. CHEM3146 Principles and applications of spectroscopic and analytical techniques is not offered from 2016-17. Students should consult the course selection advisers for course replacement.

Remarks

Offered to students 2012

admitted to Year 1 in

Objectives:

The Major in Chemistry aims to provide students with a solid training in major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. A wide selection of elective courses in chemical biology, chemical analysis, computational chemistry, environmental chemistry, industrial chemistry, interfacial science, material, and medicinal chemistry, is also available to provide students with knowledge and training to help them meet the dynamic and ever-changing challenges in science and technology. Graduates of the Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences that are crucial for their future careers in a knowledge-based economy. It is expected that our graduates will be able to meet local and regional requirements in the industrial, commercial, government or education sectors and will become future leaders of these sectors.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 2: demonstrate an in-depth understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical & practical problems (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 3: have developed an awareness & understanding of scientific and ethical issues where chemistry relates to other disciplines, and an appreciation of the impact of chemistry in the modern world (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 4: have substantially developed advanced experimental skills including chemical synthesis, analysis & operation of modern instrumentation, and data analysis skills with the ability to interpret experimental information & infer appropriate conclusions (by requiring of no less than 100 hours of laboratory classes in the curriculum)
- PLO 5: demonstrate problem-solving skills, critical thinking, creativity & effective written & oral communication skills, and to co-operate with other people & participate as an effective team member (by means of coursework, laboratory-based learning, group project & presentation opportunities in the curriculum)
- PLO 6: gain experience in working in the real-life industrial or research environment, and enhance their initiative, interpersonal skills, time management skills & project organization skills (by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistry-related companies or research laboratories)

Impermissible Combinations:

Minor in Chemistry

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

CHEM1042 General chemistry I (6) [previous title: General chemistry (6)]

CHEM2241 Analytical chemistry I (6)
CHEM2341 Inorganic chemistry I (6)
CHEM2441 Organic chemistry I (6)

CHEM2541 Introductory physical chemistry (6) [previous title: Physical chemistry I (6)]

2. Advanced level courses (48 credits) Disciplinary Core Courses (30 credits)

CHEM3146 Principles and applications of spectroscopic and analytical techniques (6)

Analytical chemistry II: chemical instrumentation (6) Inorganic chemistry II (6)

Organic chemistry II (6)

CHEM3541 Physical chemistry: Introduction to quantum [previous title: Physical chemistry II: Introduction to

chemistry (6) quantum chemistry (6)]

Disciplinary Electives (12 credits)

At least 12 credits selected from the following 18 credits of courses in two different areas in List A:

List A

CHEM3241

CHEM3341

CHFM3441

CHEM3542 Physical chemistry: statistical Take either CHEM3542 or CHEM4541 to fulfill this 12 thermodynamics and kinetics theory (6) credits requirement, but not both.

CHEM4341 Advanced inorganic chemistry (6)

CHEM4441 Advanced organic chemistry (6)

Take either CHEM4443 or CHEM4441 to fulfill this 12 credits requirement, but not both.

CHEM4443 Integrated organic synthesis (6)

Take either CHEM4443 or CHEM4441 to fulfill this 12

credits requirement, but not both.

CHEM4541 Physical chemistry III: statistical Take either CHEM3542 or CHEM4541 to fulfill this 12

thermodynamics and kinetics theory (6) credits requirement, but not both.

Disciplinary Electives (6 credits)

At least 6 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level, excluding CHEM3999 Directed studies in chemistry, CHEM4910 Chemistry literacy and research, CHEM4911 Capstone experience for chemistry undergraduates: HKUtopia, CHEM4966 Chemistry internship and CHEM4999 Chemistry project), subject to pre-requisite requirements. The current list inlcude courses in List B and those courses not selected to fulfill the requirements in List A.

CHEM3141 Environmental chemistry (6)

CHEM3142 Chemical process industries and analysis (6) CHEM3143 Introduction to materials chemistry (6)

CHEM3242 Food and water analysis (6) CHEM3342 Bioinorganic chemistry (6)

CHEM3442 Organic chemistry of biomolecules (6)
CHEM3443 Organic chemistry laboratory (6)

CHEM3445 Integrated laboratory (6)

CHEM4142 Symmetry, group theory and applications (6) CHEM4143 Interfacial science and technology (6)

CHEM4144 Advanced materials (6)
CHEM4145 Medicinal chemistry (6)
CHEM4147 Supramolecular chemistry (6)

CHEM4148 Frontiers in Modern Chemical Science (6)

CHEM4241 Modern chemical instrumentation and

applications (6)
CHEM4242 Analytical chemistry (6)
CHEM4342 Organometallic chemistry (6)
CHEM4444 Chemical biology (6)
CHEM4542 Computational chemistry (6)
CHEM4543 Advanced physical chemistry (6)

CHEM4544 Electrochemical science and technology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

CHEM3999 Directed studies in chemistry (6)
CHEM4910 Chemistry literacy and research (6)
CHEM4911 Capstone experience for chemistry

undergraduates: HKUtopia (6)

CHEM4966 Chemistry internship (6) CHEM4999 Chemistry project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.
- 6. CHEM3146 Principles and applications of spectroscopic and analytical techniques is not offered from 2016-17. Students should consult the course selection advisers for course replacement.

Remarks:

Major Title Major in Chemistry (Intensive)

Offered to students 2020

admitted to Year 1 in

Objectives:

The Intensive Major in Chemistry aims to provide students with a strong foundation on major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. The curriculum emphasizes comprehensive coverage in theoretical knowledge, laboratory skills, and research experience. A wide selection of elective courses is also available for student preparation to pursue learning in specializations such as chemical biology, computation chemistry, and materials. Graduates of the Intensive Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences. Graduates are expected to be well-prepared for further studies in chemistry and related disciplines and to pursue professional careers in scientific and technical fields.

This intensive major has been accredited by the Royal Society of Chemistry (RSC), UK.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 2: demonstrate an in-depth understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical & practical problems (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 3: have developed an awareness & understanding of scientific and ethical issues where chemistry relates to other disciplines, and an appreciation of the impact of chemistry in the modern world (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 4: have substantially developed advanced experimental skills including chemical synthesis, analysis & operation of modern instrumentation, and data analysis skills with the ability to interpret experimental information & infer appropriate conclusions (by requiring of no less than 300 hours of laboratory classes in the curriculum)
- PLO 5: demonstrate problem-solving skills, critical thinking, creativity & effective written & oral communication skills, and to co-operate with other people & participate as an effective team member (by means of coursework, laboratory-based learning, group project & presentation opportunities in the curriculum)
- PLO 6: gain experience in working in the real-life industrial or research environment, and enhance their initiative, interpersonal skills, time management skills & project organization skills (by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistry-related companies or research laboratories)

Impermissible Combinations:

Major in Chemistry Minor in Chemistry

Required courses (144 o	redits)	
1. Introductory level cours		
Disciplinary Core Courses	s: Science Foundation Courses (12 credits)	
SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core Courses	s (36 credits)	
CHEM1042	General chemistry I (6)	(Note 1)
CHEM1043	General chemistry II (6)	(Note 1)
CHEM2241	Analytical chemistry I (6)	(Note 1)
CHEM2341	Inorganic chemistry I (6)	(Note 1)
CHEM2441	Organic chemistry I (6)	(Note 1)
CHEM2541	Introductory physical chemistry (6)	(Note 1)
Disciplinary Electives (6 c	redits)	
(Students are encourage	d to meet with a Chemistry Course Selection Advisor in the course selec	ction period to discuss
which of the following co	urses they should take based on their previous background in Mathemat	ics.)
CHEM1044	Mathematics in chemistry (6)	
COMP1117	Computer programming (6)	
MATH1011	University mathematics I (6)	
MATH1013	University mathematics II (6)	
STAT1601	Elementary statistical methods (6)	
STAT1603	Introductory statistics (6)	
2. Advanced level courses	s (78 credits)	
Disciplinary Core Course	(66 credits)	
CHEM3143	Introduction to materials chemistry (6)	
CHEM3241	Analytical chemistry II: chemical instrumentation (6)	(Note 1)
CHEM3341	Inorganic chemistry II (6)	(Note 1)
CHEM3441	Organic chemistry II (6)	(Note 1)
CHEM3443	Organic chemistry laboratory (6)	(Note 1)
CHEM3445	Integrated laboratory (6)	
CHEM3541	Physical chemistry: Introduction to quantum chemistry (6)	(Note 1)
CHEM3542	Physical chemistry: statistical thermodynamics and kinetics theory (6)	

(lab)

(lab)

(lab)

(lab)

CHEM4142 Symmetry, group theory and applications (6)

CHEM4144 Advanced materials (6)

CHEM4241 Modern chemical instrumentation and applications (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

(Note that one of the two elective courses selected must contain a laboratory component. Courses marked with (lab)

have a laboratory component. The list of electives given below may be subject to change.)

CHEM4143 Interfacial science and technology (6)

CHEM4145 Medicinal chemistry (6)
CHEM4147 Supramolecular chemistry (6)

CHEM4148 Frontiers in Modern Chemical Science (6)

CHEM4242 Analytical chemistry (6) (lab)
CHEM4341 Advanced inorganic chemistry (6)

CHEM4342 Organometallic chemistry (6)
CHEM4441 Advanced organic chemistry (6)
Integrated organic synthesis (6)

CHEM4443 Integrated organic synthesis (6)
CHEM4444 Chemical biology (6)

CHEM4542 Computational chemistry (6)
CHEM4543 Advanced physical chemistry (6)
CHEM4544 Electrochemical science and technology (6)

3. Capstone requirement (12 credits)

At least 12 credits selected from the following courses:

CHEM3999 Directed studies in chemistry (6)
CHEM4966 Chemistry internship (6)
CHEM4999 Chemistry project (12)

Notes:

- 1. These are core courses in the regular Chemistry Major (96 credits) curriculum.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.
- 3. As this curriculum is accredited by the Royal Society of Chemistry (RSC), students must follow the curriculum in full (i.e. no replacement courses are possible) in order to graduate with this accredited programme. For students who have credit transfer from exchange studies, for example) a student took CHEM3A and CHEM3B in a host university during his/her exchange studies and these two courses have been approved by the Faculty of Science to be considered equivalent as CHEM3241 and CHEM3341, they will be considered taking those HKU-version courses and in the example shown here, the student is deemed to have taken CHEM3241 and CHEM3341 to fulfil the accredited curriculum.
- 4. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks

Major Title Major in Chemistry (Intensive)

Offered to students 2019

admitted to Year 1 in

Objectives:

The Intensive Major in Chemistry aims to provide students with a strong foundation on major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. The curriculum emphasizes comprehensive coverage in theoretical knowledge, laboratory skills, and research experience. A wide selection of elective courses is also available for student preparation to pursue learning in specializations such as chemical biology, computation chemistry, and materials. Graduates of the Intensive Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences. Graduates are expected to be well-prepared for further studies in chemistry and related disciplines and to pursue professional careers in scientific and technical fields.

This intensive major has been accredited by the Royal Society of Chemistry (RSC), UK.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 2: demonstrate an in-depth understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical & practical problems (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 3: have developed an awareness & understanding of scientific and ethical issues where chemistry relates to other disciplines, and an appreciation of the impact of chemistry in the modern world (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 4: have substantially developed advanced experimental skills including chemical synthesis, analysis & operation of modern instrumentation, and data analysis skills with the ability to interpret experimental information & infer appropriate conclusions (by requiring of no less than 300 hours of laboratory classes in the curriculum)
- PLO 5: demonstrate problem-solving skills, critical thinking, creativity & effective written & oral communication skills, and to co-operate with other people & participate as an effective team member (by means of coursework, laboratory-based learning, group project & presentation opportunities in the curriculum)
- PLO 6: gain experience in working in the real-life industrial or research environment, and enhance their initiative, interpersonal skills, time management skills & project organization skills (by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistry-related companies or research laboratories)

Impermissible Combinations:

Major in Chemistry
Minor in Chemistry

equired courses (144	credits)			
I. Introductory level cour				
Disciplinary Core Courses: Science Foundation Courses (12 credits)				
SCNC1111	Scientific method and reasoning (6)	(Note 1)		
SCNC1112	Fundamentals of modern science (6)	(Note 1)		
Disciplinary Core Course	s (36 credits)			
CHEM1042	General chemistry I (6)	(Note 1)		
CHEM1043	General chemistry II (6)	(Note 1)		
CHEM2241	Analytical chemistry I (6)	(Note 1)		
CHEM2341	Inorganic chemistry I (6)	(Note 1)		
CHEM2441	Organic chemistry I (6)	(Note 1)		
CHEM2541	Introductory physical chemistry (6)	(Note 1)		
Disciplinary Electives (6	credits)			
(Students are encourage	ed to meet with a Chemistry Course Selection Advisor in the course sel	lection period to discus		
which of the following co	ourses they should take based on their previous background in Mathem	atics.)		
CHEM1044	Mathematics in chemistry (6)			
COMP1117	Computer programming (6)			
MATH1011	University mathematics I (6)			
MATH1013	University mathematics II (6)			
STAT1601	Elementary statistical methods (6)			
STAT1603	Introductory statistics (6)			
2. Advanced level course	s (78 credits)			
Disciplinary Core Course	(66 credits)			
CHEM3143	Introduction to materials chemistry (6)			
CHEM3241	Analytical chemistry II: chemical instrumentation (6)	(Note 1)		
CHEM3341	Inorganic chemistry II (6)	(Note 1)		
CHEM3441	Organic chemistry II (6)	(Note 1)		
CHEM3443	Organic chemistry laboratory (6)	(Note 1)		
CHEM3445	Integrated laboratory (6)			
CHEM3541	Physical chemistry: Introduction to quantum chemistry (6)	(Note 1)		
CHEM3542	Physical chemistry: statistical thermodynamics and kinetics			

(lab)

(lab)

(lab)

(lab)

CHEM4142 Symmetry, group theory and applications (6) CHEM4144 Advanced materials (6)

CHEM4241 Modern chemical instrumentation and applications (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

(Note that one of the two elective courses selected must contain a laboratory component. Courses marked with (lab)

have a laboratory component. The list of electives given below may be subject to change.)

CHEM4143 Interfacial science and technology (6)

CHEM4145 Medicinal chemistry (6)
CHEM4147 Supramolecular chemistry (6)

CHEM4148 Frontiers in Modern Chemical Science (6)

CHEM4242 Analytical chemistry (6)
CHEM4341 Advanced inorganic chemistry (6)

CHEM4342 Organometallic chemistry (6)
CHEM4441 Advanced organic chemistry (6)
CHEM4443 Integrated organic synthesis (6)

CHEM4444 Chemical biology (6)
CHEM4542 Computational chemistry (6) (lab)
CHEM4543 Advanced physical chemistry (6)

CHEM4544 Electrochemical science and technology (6)

3. Capstone requirement (12 credits)

At least 12 credits selected from the following courses:

CHEM3999 Directed studies in chemistry (6)
CHEM4966 Chemistry internship (6)
CHEM4999 Chemistry project (12)

Notes:

- 1. These are core courses in the regular Chemistry Major (96 credits) curriculum.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.
- 3. As this curriculum is accredited by the Royal Society of Chemistry (RSC), students must follow the curriculum in full (i.e. no replacement courses are possible) in order to graduate with this accredited programme. For students who have credit transfer from exchange studies, for example) a student took CHEM3A and CHEM3B in a host university during his/her exchange studies and these two courses have been approved by the Faculty of Science to be considered equivalent as CHEM3241 and CHEM3341, they will be considered taking those HKU-version courses and in the example shown here, the student is deemed to have taken CHEM3241 and CHEM3341 to fulfil the accredited curriculum.

Remarks:

Major Title Major in Chemistry (Intensive)

Offered to students 2018

admitted to Year 1 in

Objectives:

The Intensive Major in Chemistry aims to provide students with a strong foundation on major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. The curriculum emphasizes comprehensive coverage in theoretical knowledge, laboratory skills, and research experience. A wide selection of elective courses is also available for student preparation to pursue learning in specializations such as chemical biology, computation chemistry, and materials. Graduates of the Intensive Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences. Graduates are expected to be well-prepared for further studies in chemistry and related disciplines and to pursue professional careers in scientific and technical fields.

This intensive major has been accredited by the Royal Society of Chemistry (RSC), UK.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 2: demonstrate an in-depth understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical & practical problems (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 3: have developed an awareness & understanding of scientific and ethical issues where chemistry relates to other disciplines, and an appreciation of the impact of chemistry in the modern world (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 4: have substantially developed advanced experimental skills including chemical synthesis, analysis & operation of modern instrumentation, and data analysis skills with the ability to interpret experimental information & infer appropriate conclusions (by requiring of no less than 300 hours of laboratory classes in the curriculum)
- PLO 5: demonstrate problem-solving skills, critical thinking, creativity & effective written & oral communication skills, and to co-operate with other people & participate as an effective team member (by means of coursework, laboratory-based learning, group project & presentation opportunities in the curriculum)
- PLO 6: gain experience in working in the real-life industrial or research environment, and enhance their initiative, interpersonal skills, time management skills & project organization skills (by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistry-related companies or research laboratories)

Impermissible Combinations:

Major in Chemistry
Minor in Chemistry

equired courses (144	credits)			
I. Introductory level cour				
Disciplinary Core Courses: Science Foundation Courses (12 credits)				
SCNC1111	Scientific method and reasoning (6)	(Note 1)		
SCNC1112	Fundamentals of modern science (6)	(Note 1)		
Disciplinary Core Course	s (36 credits)			
CHEM1042	General chemistry I (6)	(Note 1)		
CHEM1043	General chemistry II (6)	(Note 1)		
CHEM2241	Analytical chemistry I (6)	(Note 1)		
CHEM2341	Inorganic chemistry I (6)	(Note 1)		
CHEM2441	Organic chemistry I (6)	(Note 1)		
CHEM2541	Introductory physical chemistry (6)	(Note 1)		
Disciplinary Electives (6	credits)			
(Students are encourage	ed to meet with a Chemistry Course Selection Advisor in the course sel	lection period to discus		
which of the following co	ourses they should take based on their previous background in Mathem	atics.)		
CHEM1044	Mathematics in chemistry (6)			
COMP1117	Computer programming (6)			
MATH1011	University mathematics I (6)			
MATH1013	University mathematics II (6)			
STAT1601	Elementary statistical methods (6)			
STAT1603	Introductory statistics (6)			
2. Advanced level course	s (78 credits)			
Disciplinary Core Course	(66 credits)			
CHEM3143	Introduction to materials chemistry (6)			
CHEM3241	Analytical chemistry II: chemical instrumentation (6)	(Note 1)		
CHEM3341	Inorganic chemistry II (6)	(Note 1)		
CHEM3441	Organic chemistry II (6)	(Note 1)		
CHEM3443	Organic chemistry laboratory (6)	(Note 1)		
CHEM3445	Integrated laboratory (6)			
CHEM3541	Physical chemistry: Introduction to quantum chemistry (6)	(Note 1)		
CHEM3542	Physical chemistry: statistical thermodynamics and kinetics			

(lab)

(lab)

(lab)

(lab)

CHEM4142 Symmetry, group theory and applications (6)

CHEM4144 Advanced materials (6)

CHEM4241 Modern chemical instrumentation and applications (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

(Note that one of the two elective courses selected must contain a laboratory component. Courses marked with (lab)

have a laboratory component. The list of electives given below may be subject to change.)

CHEM4143 Interfacial science and technology (6)

CHEM4145 Medicinal chemistry (6)
CHEM4147 Supramolecular chemistry (6)

CHEM4148 Frontiers in Modern Chemical Science (6)

CHEM4242 Analytical chemistry (6)
CHEM4341 Advanced inorganic chemistry (6)

CHEM4342 Organometallic chemistry (6)
CHEM4441 Advanced organic chemistry (6)

CHEM4443 Integrated organic synthesis (6)
CHEM4444 Chemical biology (6)

CHEM4542 Computational chemistry (6)
CHEM4543 Advanced physical chemistry (6)

CHEM4544 Electrochemical science and technology (6) (lab)

3. Capstone requirement (12 credits)

At least 12 credits selected from the following courses:

CHEM3999 Directed studies in chemistry (6)
CHEM4966 Chemistry internship (6)
CHEM4999 Chemistry project (12)

Notes:

- 1. These are core courses in the regular Chemistry Major (96 credits) curriculum.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.
- 3. As this curriculum is accredited by the Royal Society of Chemistry (RSC), students must follow the curriculum in full (i.e. no replacement courses are possible) in order to graduate with this accredited programme. For students who have credit transfer from exchange studies, for example) a student took CHEM3A and CHEM3B in a host university during his/her exchange studies and these two courses have been approved by the Faculty of Science to be considered equivalent as CHEM3241 and CHEM3341, they will be considered taking those HKU-version courses and in the example shown here, the student is deemed to have taken CHEM3241 and CHEM3341 to fulfil the accredited curriculum.

Remarks:

Major Title Major in Chemistry (Intensive)

Offered to students 2017

admitted to Year 1 in

Objectives:

The Intensive Major in Chemistry aims to provide students with a strong foundation on major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. The curriculum emphasizes comprehensive coverage in theoretical knowledge, laboratory skills, and research experience. A wide selection of elective courses is also available for student preparation to pursue learning in specializations such as chemical biology, computation chemistry, and materials. Graduates of the Intensive Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences. Graduates are expected to be well-prepared for further studies in chemistry and related disciplines and to pursue professional careers in scientific and technical fields.

This intensive major has been accredited by the Royal Society of Chemistry (RSC), UK.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 2: demonstrate an in-depth understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical & practical problems (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 3: have developed an awareness & understanding of scientific and ethical issues where chemistry relates to other disciplines, and an appreciation of the impact of chemistry in the modern world (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 4: have substantially developed advanced experimental skills including chemical synthesis, analysis & operation of modern instrumentation, and data analysis skills with the ability to interpret experimental information & infer appropriate conclusions (by requiring of no less than 300 hours of laboratory classes in the curriculum)
- PLO 5: demonstrate problem-solving skills, critical thinking, creativity & effective written & oral communication skills, and to co-operate with other people & participate as an effective team member (by means of coursework, laboratory-based learning, group project & presentation opportunities in the curriculum)
- PLO 6: gain experience in working in the real-life industrial or research environment, and enhance their initiative, interpersonal skills, time management skills & project organization skills (by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistry-related companies or research laboratories)

Impermissible Combinations:

Major in Chemistry
Minor in Chemistry

equired courses (144	credits)			
I. Introductory level cour				
Disciplinary Core Courses: Science Foundation Courses (12 credits)				
SCNC1111	Scientific method and reasoning (6)	(Note 1)		
SCNC1112	Fundamentals of modern science (6)	(Note 1)		
Disciplinary Core Course	s (36 credits)			
CHEM1042	General chemistry I (6)	(Note 1)		
CHEM1043	General chemistry II (6)	(Note 1)		
CHEM2241	Analytical chemistry I (6)	(Note 1)		
CHEM2341	Inorganic chemistry I (6)	(Note 1)		
CHEM2441	Organic chemistry I (6)	(Note 1)		
CHEM2541	Introductory physical chemistry (6)	(Note 1)		
Disciplinary Electives (6	credits)			
(Students are encourage	ed to meet with a Chemistry Course Selection Advisor in the course sel	lection period to discus		
which of the following co	ourses they should take based on their previous background in Mathem	atics.)		
CHEM1044	Mathematics in chemistry (6)			
COMP1117	Computer programming (6)			
MATH1011	University mathematics I (6)			
MATH1013	University mathematics II (6)			
STAT1601	Elementary statistical methods (6)			
STAT1603	Introductory statistics (6)			
2. Advanced level course	s (78 credits)			
Disciplinary Core Course	(66 credits)			
CHEM3143	Introduction to materials chemistry (6)			
CHEM3241	Analytical chemistry II: chemical instrumentation (6)	(Note 1)		
CHEM3341	Inorganic chemistry II (6)	(Note 1)		
CHEM3441	Organic chemistry II (6)	(Note 1)		
CHEM3443	Organic chemistry laboratory (6)	(Note 1)		
CHEM3445	Integrated laboratory (6)			
CHEM3541	Physical chemistry: Introduction to quantum chemistry (6)	(Note 1)		
CHEM3542	Physical chemistry: statistical thermodynamics and kinetics			

(lab)

(lab)

(lab)

CHEM4142 Symmetry, group theory and applications (6) CHEM4144 Advanced materials (6)

CHEM4241 Modern chemical instrumentation and applications (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

(Note that one of the two elective courses selected must contain a laboratory component. Courses marked with (lab)

have a laboratory component. The list of electives given below may be subject to change.)

CHEM4143 Interfacial science and technology (6)

CHEM4145 Medicinal chemistry (6)
CHEM4147 Supramolecular chemistry (6)

CHEM4148 Frontiers in Modern Chemical Science (6)

CHEM4242 Analytical chemistry (6) (lab)
CHEM4341 Advanced inorganic chemistry (6)

CHEM4341 Advanced inorganic chemistry (6)
CHEM4342 Organometallic chemistry (6)

CHEM4441 Advanced organic chemistry (6)
CHEM4443 Integrated organic synthesis (6)

CHEM4444 Chemical biology (6)

CHEM4542 Computational chemistry (6) (lab)
CHEM4543 Advanced physical chemistry (6)

CHEM4544 Electrochemical science and technology (6)

3. Capstone requirement (12 credits)

At least 12 credits selected from the following courses:

CHEM3999

Directed studies in chemistry (6)

CHEM4966

CHEM4999

Chemistry project (12)

Notes:

- 1. These are core courses in the regular Chemistry Major (96 credits) curriculum.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.
- 3. As this curriculum is accredited by the Royal Society of Chemistry (RSC), students must follow the curriculum in full (i.e. no replacement courses are possible) in order to graduate with this accredited programme. For students who have credit transfer from exchange studies, for example) a student took CHEM3A and CHEM3B in a host university during his/her exchange studies and these two courses have been approved by the Faculty of Science to be considered equivalent as CHEM3241 and CHEM3341, they will be considered taking those HKU-version courses and in the example shown here, the student is deemed to have taken CHEM3241 and CHEM3341 to fulfil the accredited curriculum.

Remarks:

Major Title Major in Chemistry (Intensive)

Offered to students 2016

admitted to Year 1 in

Objectives:

The Intensive Major in Chemistry aims to provide students with a strong foundation on major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. The curriculum emphasizes comprehensive coverage in theoretical knowledge, laboratory skills, and research experience. A wide selection of elective courses is also available for student preparation to pursue learning in specializations such as chemical biology, computation chemistry, and materials. Graduates of the Intensive Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences. Graduates are expected to be well-prepared for further studies in chemistry and related disciplines and to pursue professional careers in scientific and technical fields.

This intensive major has been accredited by the Royal Society of Chemistry (RSC), UK.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 2: demonstrate an in-depth understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical & practical problems (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 3: have developed an awareness & understanding of scientific and ethical issues where chemistry relates to other disciplines, and an appreciation of the impact of chemistry in the modern world (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 4: have substantially developed advanced experimental skills including chemical synthesis, analysis & operation of modern instrumentation, and data analysis skills with the ability to interpret experimental information & infer appropriate conclusions (by requiring of no less than 300 hours of laboratory classes in the curriculum)
- PLO 5: demonstrate problem-solving skills, critical thinking, creativity & effective written & oral communication skills, and to co-operate with other people & participate as an effective team member (by means of coursework, laboratory-based learning, group project & presentation opportunities in the curriculum)
- PLO 6: gain experience in working in the real-life industrial or research environment, and enhance their initiative, interpersonal skills, time management skills & project organization skills (by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistry-related companies or research laboratories)

Impermissible Combinations:

Major in Chemistry
Minor in Chemistry

equired courses (144	credits)			
I. Introductory level cour				
Disciplinary Core Courses: Science Foundation Courses (12 credits)				
SCNC1111	Scientific method and reasoning (6)	(Note 1)		
SCNC1112	Fundamentals of modern science (6)	(Note 1)		
Disciplinary Core Course	s (36 credits)			
CHEM1042	General chemistry I (6)	(Note 1)		
CHEM1043	General chemistry II (6)	(Note 1)		
CHEM2241	Analytical chemistry I (6)	(Note 1)		
CHEM2341	Inorganic chemistry I (6)	(Note 1)		
CHEM2441	Organic chemistry I (6)	(Note 1)		
CHEM2541	Introductory physical chemistry (6)	(Note 1)		
Disciplinary Electives (6	credits)			
(Students are encourage	ed to meet with a Chemistry Course Selection Advisor in the course sel	lection period to discus		
which of the following co	ourses they should take based on their previous background in Mathem	atics.)		
CHEM1044	Mathematics in chemistry (6)			
COMP1117	Computer programming (6)			
MATH1011	University mathematics I (6)			
MATH1013	University mathematics II (6)			
STAT1601	Elementary statistical methods (6)			
STAT1603	Introductory statistics (6)			
2. Advanced level course	s (78 credits)			
Disciplinary Core Course	(66 credits)			
CHEM3143	Introduction to materials chemistry (6)			
CHEM3241	Analytical chemistry II: chemical instrumentation (6)	(Note 1)		
CHEM3341	Inorganic chemistry II (6)	(Note 1)		
CHEM3441	Organic chemistry II (6)	(Note 1)		
CHEM3443	Organic chemistry laboratory (6)	(Note 1)		
CHEM3445	Integrated laboratory (6)			
CHEM3541	Physical chemistry: Introduction to quantum chemistry (6)	(Note 1)		
CHEM3542	Physical chemistry: statistical thermodynamics and kinetics			

(lab)

(lab)

CHEM4142 Symmetry, group theory and applications (6) CHEM4144

Advanced materials (6)

CHEM4241 Modern chemical instrumentation and applications (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

(Note that one of the two elective courses selected must contain a laboratory component. Courses marked with (lab)

have a laboratory component. The list of electives given below may be subject to change.)

Interfacial science and technology (6) CHFM4143

CHEM4145 Medicinal chemistry (6) CHEM4147 Supramolecular chemistry (6)

Frontiers in Modern Chemical Science (6) CHEM4148

CHEM4242 Analytical chemistry (6) (lab) Advanced inorganic chemistry (6) CHEM4341 (lab)

CHEM4342 Organometallic chemistry (6) Advanced organic chemistry (6) CHFM4441 Integrated organic synthesis (6) CHEM4443

CHEM4444 Chemical biology (6) Computational chemistry (6) CHEM4542 Advanced physical chemistry (6)

CHEM4543 CHEM4544 Electrochemical science and technology (6) (lab)

3. Capstone requirement (12 credits)

At least 12 credits selected from the following courses:

CHEM3999 Directed studies in chemistry (6) CHEM4966 Chemistry internship (6) CHEM4999 Chemistry project (12)

Notes:

- 1. These are core courses in the regular Chemistry Major (96 credits) curriculum.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.
- 3. As this curriculum is accredited by the Royal Society of Chemistry (RSC), students must follow the curriculum in full (i.e. no replacement courses are possible) in order to graduate with this accredited programme. For students who have credit transfer from exchange studies, for example) a student took CHEM3A and CHEM3B in a host university during his/her exchange studies and these two courses have been approved by the Faculty of Science to be considered equivalent as CHEM3241 and CHEM3341, they will be considered taking those HKUversion courses and in the example shown here, the student is deemed to have taken CHEM3241 and CHEM3341 to fulfil the accredited curriculum.

Remarks:

Major Title Major in Chemistry (Intensive)

Offered to students 2015

admitted to Year 1 in

Objectives:

The Intensive Major in Chemistry aims to provide students with a strong foundation on major areas of chemistry. The curriculum includes core courses covering topics in physical, inorganic, organic, and analytical chemistry. The curriculum emphasizes comprehensive coverage in theoretical knowledge, laboratory skills, and research experience. A wide selection of elective courses is also available for student preparation to pursue learning in specializations such as chemical biology, computation chemistry, and materials. Graduates of the Intensive Chemistry Major programme will be proficient in the principles and experimental skills of chemistry. The programme will also equip students with transferable skills in both theoretical and experimental investigations in sciences. Graduates are expected to be well-prepared for further studies in chemistry and related disciplines and to pursue professional careers in scientific and technical fields.

This intensive major has been accredited by the Royal Society of Chemistry (RSC), UK.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate an understanding across a wide range of topics in chemistry, from basic areas such as analytical, inorganic, organic & physical chemistry, to advanced topics related to current research in chemistry (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 2: demonstrate an in-depth understanding of fundamental physicochemical principles with the ability to apply that knowledge to the solution of theoretical & practical problems (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 3: have developed an awareness & understanding of scientific and ethical issues where chemistry relates to other disciplines, and an appreciation of the impact of chemistry in the modern world (by means of coursework, laboratory-based and/or research-based learning in the curriculum)
- PLO 4: have substantially developed advanced experimental skills including chemical synthesis, analysis & operation of modern instrumentation, and data analysis skills with the ability to interpret experimental information & infer appropriate conclusions (by requiring of no less than 300 hours of laboratory classes in the curriculum)
- PLO 5: demonstrate problem-solving skills, critical thinking, creativity & effective written & oral communication skills, and to co-operate with other people & participate as an effective team member (by means of coursework, laboratory-based learning, group project & presentation opportunities in the curriculum)
- PLO 6: gain experience in working in the real-life industrial or research environment, and enhance their initiative, interpersonal skills, time management skills & project organization skills (by arrangement for student internship opportunities or directed studies of no less than three weeks with chemistry-related companies or research laboratories)

Impermissible Combinations:

Major in Chemistry
Minor in Chemistry

equired courses (144	credits)			
I. Introductory level cour	ses (54 credits)			
Disciplinary Core Courses: Science Foundation Courses (12 credits)				
SCNC1111	Scientific method and reasoning (6)	(Note 1)		
SCNC1112	Fundamentals of modern science (6)	(Note 1)		
Disciplinary Core Course	s (36 credits)			
CHEM1042	General chemistry I (6)	(Note 1)		
CHEM1043	General chemistry II (6)	(Note 1)		
CHEM2241	Analytical chemistry I (6)	(Note 1)		
CHEM2341	Inorganic chemistry I (6)	(Note 1)		
CHEM2441	Organic chemistry I (6)	(Note 1)		
CHEM2541	Introductory physical chemistry (6)	(Note 1)		
Disciplinary Electives (6 o	credits)			
(Students are encourage	ed to meet with a Chemistry Course Selection Advisor in the course selec	tion period to discus		
which of the following co	ourses they should take based on their previous background in Mathemat	ics.)		
CHEM1044	Mathematics in chemistry (6)			
COMP1117	Computer programming (6)			
MATH1011	University mathematics I (6)			
MATH1013	University mathematics II (6)			
STAT1601	Elementary statistical methods (6)			
STAT1603	Introductory statistics (6)			
STALIOUS	(70 and ita)			
2. Advanced level course	es (76 creats)			
	,			
2. Advanced level course	,			
2. Advanced level course Disciplinary Core Course	e (66 credits)	(Note 1)		
2. Advanced level course Disciplinary Core Course CHEM3143	(66 credits) Introduction to materials chemistry (6)	(Note 1) (Note 1)		
2. Advanced level course Disciplinary Core Course CHEM3143 CHEM3241	e (66 credits) ^ Introduction to materials chemistry (6) Analytical chemistry II: chemical instrumentation (6)	, ,		
2. Advanced level course Disciplinary Core Course CHEM3143 CHEM3241 CHEM3341	e (66 credits) Introduction to materials chemistry (6) Analytical chemistry II: chemical instrumentation (6) Inorganic chemistry II (6)	(Note 1)		
2. Advanced level course Disciplinary Core Course CHEM3143 CHEM3241 CHEM3341 CHEM3441	P (66 credits) Introduction to materials chemistry (6) Analytical chemistry II: chemical instrumentation (6) Inorganic chemistry II (6) Organic chemistry II (6)	(Note 1) (Note 1)		
2. Advanced level course Disciplinary Core Course CHEM3143 CHEM3241 CHEM3341 CHEM3441 CHEM3443	Introduction to materials chemistry (6) Analytical chemistry II: chemical instrumentation (6) Inorganic chemistry II (6) Organic chemistry II (6) Organic chemistry laboratory (6)	(Note 1) (Note 1)		

(lab)

(lab)

(lab)

CHEM4142 Symmetry, group theory and applications (6) CHEM4144 Advanced materials (6)

CHEM4241 Modern chemical instrumentation and applications (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

(Note that one of the two elective courses selected must contain a laboratory component. Courses marked with (lab)

have a laboratory component. The list of electives given below may be subject to change.)

CHEM4143 Interfacial science and technology (6)

CHEM4145 Medicinal chemistry (6)
CHEM4147 Supramolecular chemistry (6)

CHEM4148 Frontiers in Modern Chemical Science (6)

CHEM4242 Analytical chemistry (6) (lab)
CHEM4341 Advanced inorganic chemistry (6)
CHEM4342 Organometallic chemistry (6) (lab)

CHEM4342 Organometallic chemistry (6)
CHEM4441 Advanced organic chemistry (6)
CHEM4443 Integrated organic synthesis (6)

CHEM4444 Chemical biology (6)
CHEM4542 Computational chemistry (6)
CHEM4543 Advanced physical chemistry (6)

CHEM4544 Electrochemical science and technology (6)

3. Capstone requirement (12 credits)

At least 12 credits selected from the following courses:

CHEM3999 Directed studies in chemistry (6)
CHEM4966 Chemistry internship (6)
CHEM4999 Chemistry project (12)

Notes:

- 1. These are core courses in the regular Chemistry Major (96 credits) curriculum.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.
- 3. As this curriculum is accredited by the Royal Society of Chemistry (RSC), students must follow the curriculum in full (i.e. no replacement courses are possible) in order to graduate with this accredited programme. For students who have credit transfer from exchange studies, for example) a student took CHEM3A and CHEM3B in a host university during his/her exchange studies and these two courses have been approved by the Faculty of Science to be considered equivalent as CHEM3241 and CHEM3341, they will be considered taking those HKU-version courses and in the example shown here, the student is deemed to have taken CHEM3241 and CHEM3341 to fulfil the accredited curriculum.

Remarks:

Offered to students 2020

admitted to Year 1 in

Objectives:

Amidst an upsurge of digital data produced worldwide nowadays, the Major in Decision Analytics aims to equip students with the skills and expertise in leveraging and managing big data in real time, and provide them with solid training in making digitized information a strategic part of critical decision-making and resource allocation with greater clarity and accuracy. Core courses in the curriculum emphasize the fundamental concepts and methodologies of decision analytics which include but not limited to statistical analysis, data mining and data visualization, programming, data structuring, mathematical and statistical modelling and implementation of database systems. Elective courses focus on diverse and applied techniques of decision analytics in multidisciplinary fields.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the concepts of decision analytics and its underlying theory in relation to a broad range of related disciplinary academic or professional areas (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: identify and adopt appropriate analytical techniques and tools to extract and classify critical information from structured or unstructured data (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: be proficient with the design and implementation of advanced modelling techniques and database management, and offer effective recommendations for analytic initiatives and solutions (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: evaluate the quality of information from different sources in support of critical decision making, process streamlining and the optimization of resources, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate to people effectively and efficiently with professionalism and accuracy using interactive and dynamic tools to translate technical information and present collaborative and strategic ideas (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: gain insights into current advances in decision analytics and confidence to solve real-life problems through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

BASc in Applied Artificial Intelligence

BEng in Computer Science

Major in Computing and Data Analytics

Major in Computer Science

Minor in Computer Science Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

COMP1117 Computer programming (6)

COMP2119 Introduction to data structures and algorithms (6)

MATH1013 University mathematics II (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (42 credits) Disciplinary Core Courses (30 credits)

COMP3278 Introduction to database management systems (6)

MATH3904 Introduction to optimization (6) STAT3600 Linear statistical analysis (6) STAT3612 Statistical machine learning (6)

STAT4609 Big data analytics (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

COMP3250 Design and analysis of algorithms (6) COMP3270 Artificial intelligence (6)

COMP3323 Advanced database systems (6)

COMP3407 Scientific computing (6)

MATH3408 Computational methods and differential equations with

applications (6)

MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3901 Operations research I (6)

STAT3620 Modern nonparametric statistics (6)
STAT3621 Statistical data analysis (6)
STAT3622 Data visualization (6)

STAT3622 Data visualization (6)
STAT4601 Time-series analysis (6)
STAT4602 Multivariate data analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses: STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

1. Students may consider taking the following courses if they wish to pursue a more focused study in the following areas:

a. Biomedical Analytics

BIOL4417 'Omics' and systems biology

STAT3607 Statistics in clinical medicine and bio-medical research

STAT3608 Statistical genetics

STAT3620 Modern nonparametric statistics

STAT3621 Statistical data analysis

STAT4602 Multivariate data analysis

b. Financial and Risk Analytics

STAT3621 Statistical data analysis

STAT4601 Time series analysis

Plus advanced level courses listed for the Major in Risk Management

c. Operational Analytics

COMP3250 Design and analysis of algorithms

MATH3600 Discrete mathematics

MATH3901 Operations research I

MATH3943 Network models in operations research

MATH4902 Operations research II

STAT3606 Business logistics

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at http://www.scifac.hku.hk/ug/current/bsc/curriculum/overlapping-course-req.
- 7. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Offered to students 2019

admitted to Year 1 in

Objectives:

Amidst an upsurge of digital data produced worldwide nowadays, the Major in Decision Analytics aims to equip students with the skills and expertise in leveraging and managing big data in real time, and provide them with solid training in making digitized information a strategic part of critical decision-making and resource allocation with greater clarity and accuracy. Core courses in the curriculum emphasize the fundamental concepts and methodologies of decision analytics which include but not limited to statistical analysis, data mining and data visualization, programming, data structuring, mathematical and statistical modelling and implementation of database systems. Elective courses focus on diverse and applied techniques of decision analytics in multidisciplinary fields.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the concepts of decision analytics and its underlying theory in relation to a broad range of related disciplinary academic or professional areas (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: identify and adopt appropriate analytical techniques and tools to extract and classify critical information from structured or unstructured data (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: be proficient with the design and implementation of advanced modelling techniques and database management, and offer effective recommendations for analytic initiatives and solutions (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: evaluate the quality of information from different sources in support of critical decision making, process streamlining and the optimization of resources, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate to people effectively and efficiently with professionalism and accuracy using interactive and dynamic tools to translate technical information and present collaborative and strategic ideas (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: gain insights into current advances in decision analytics and confidence to solve real-life problems through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

BASc in Applied Artificial Intelligence

BEng in Computer Science

Major in Computing and Data Analytics

Major in Computer Science

Minor in Computer Science

Major in Risk Management Major in Statistics

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

COMP1117 Computer programming (6)

COMP2119 Introduction to data structures and algorithms (6)

MATH1013 University mathematics II (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (30 credits)

COMP3278 Introduction to database management systems (6)

MATH3904 Introduction to optimization (6) STAT3600 Linear statistical analysis (6) STAT3612 Statistical machine learning (6)

STAT4609 Big data analytics (6) **Disciplinary Electives (12 credits)**

At least 12 credits selected from the following courses:

COMP3250 Design and analysis of algorithms (6)

COMP3270 Artificial intelligence (6)
COMP3323 Advanced database systems (6)

COMP3407 Scientific computing (6)

MATH3408 Computational methods and differential equations with

applications (6)

MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3901 Operations research I (6)

STAT3620 Modern nonparametric statistics (6)
STAT3621 Statistical data analysis (6)
STAT3622 Data visualization (6)
STAT4604 Time series analysis (6)

STAT4601 Time-series analysis (6)
STAT4602 Multivariate data analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses: STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

1. Students may consider taking the following courses if they wish to pursue a more focused study in the following areas:

a. Biomedical Analytics

BIOL4417 'Omics' and systems biology

STAT3607 Statistics in clinical medicine and bio-medical research

STAT3608 Statistical genetics

STAT3620 Modern nonparametric statistics

STAT3621 Statistical data analysis

STAT4602 Multivariate data analysis

b. Financial and Risk Analytics

STAT3621 Statistical data analysis

STAT4601 Time series analysis

Plus advanced level courses listed for the Major in Risk Management

c. Operational Analytics

COMP3250 Design and analysis of algorithms

MATH3600 Discrete mathematics

MATH3901 Operations research I

MATH3943 Network models in operations research

MATH4902 Operations research II

STAT3606 Business logistics

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at http://www.scifac.hku.hk/ug/current/bsc/curriculum/overlapping-course-req.

Remarks:

Offered to students 2018

admitted to Year 1 in

Objectives:

Amidst an upsurge of digital data produced worldwide nowadays, the Major in Decision Analytics aims to equip students with the skills and expertise in leveraging and managing big data in real time, and provide them with solid training in making digitized information a strategic part of critical decision-making and resource allocation with greater clarity and accuracy. Core courses in the curriculum emphasize the fundamental concepts and methodologies of decision analytics which include but not limited to statistical analysis, data mining and data visualization, programming, data structuring, mathematical and statistical modelling and implementation of database systems. Elective courses focus on diverse and applied techniques of decision analytics in multidisciplinary fields.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the concepts of decision analytics and its underlying theory in relation to a broad range of related disciplinary academic or professional areas (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
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Impermissible Combinations:

BEng in Computer Science

Major in Computing and Data Analytics

Major in Computer Science

Minor in Computer Science

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

COMP1117 Computer programming (6)

COMP2119 Introduction to data structures and algorithms (6)

MATH1013 University mathematics II (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (30 credits)

COMP3278 Introduction to database management systems (6)

MATH3904 Introduction to optimization (6) STAT3600 Linear statistical analysis (6) STAT3612 Statistical machine learning (6)

Big data analytics (6)

Disciplinary Electives (12 credits)

STAT4609

At least 12 credits selected from the following courses:

COMP3250 Design and analysis of algorithms (6)

COMP3270 Artificial intelligence (6)
COMP3323 Advanced database systems (6)

COMP3407 Scientific computing (6)
MATH3408 Computational methods and differential equations with

applications (6)

MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3901 Operations research I (6)

STAT3620 Modern nonparametric statistics (6)

[previous title: Data mining (6)]

STAT3621 Statistical data analysis (6)
STAT3622 Data visualization (6)
STAT4601 Time-series analysis (6)
STAT4602 Multivariate data analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses: STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

1. Students may consider taking the following courses if they wish to pursue a more focused study in the following areas:

a. Biomedical Analytics

BIOL4417 'Omics' and systems biology

STAT3607 Statistics in clinical medicine and bio-medical research

STAT3608 Statistical genetics

STAT3620 Modern nonparametric statistics

STAT3621 Statistical data analysis

STAT4602 Multivariate data analysis

b. Financial and Risk Analytics

STAT3621 Statistical data analysis

STAT4601 Time series analysis

Plus advanced level courses listed for the Major in Risk Management

c. Operational Analytics

COMP3250 Design and analysis of algorithms

MATH3600 Discrete mathematics

MATH3901 Operations research I

MATH3943 Network models in operations research

MATH4902 Operations research II

STAT3606 Business logistics

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 5. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at http://www.scifac.hku.hk/ug/current/bsc/curriculum/overlapping-course-req.

Remarks:

Offered to students 2017

admitted to Year 1 in

Objectives:

Amidst an upsurge of digital data produced worldwide nowadays, the Major in Decision Analytics aims to equip students with the skills and expertise in leveraging and managing big data in real time, and provide them with solid training in making digitized information a strategic part of critical decision-making and resource allocation with greater clarity and accuracy. Core courses in the curriculum emphasize the fundamental concepts and methodologies of decision analytics which include but not limited to statistical analysis, data mining and data visualization, programming, data structuring, mathematical and statistical modelling and implementation of database systems. Elective courses focus on diverse and applied techniques of decision analytics in multidisciplinary fields.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the concepts of decision analytics and its underlying theory in relation to a broad range of related disciplinary academic or professional areas (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
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- PLO 6: gain insights into current advances in decision analytics and confidence to solve real-life problems through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

BEng in Computer Science

Major in Computing and Data Analytics

Major in Computer Science

Minor in Computer Science

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

COMP1117 Computer programming (6)

COMP2119 Introduction to data structures and algorithms (6)

MATH1013 University mathematics II (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (30 credits)

COMP3278 Introduction to database management systems (6)

MATH3904 Introduction to optimization (6) STAT3600 Linear statistical analysis (6) STAT3612 Statistical machine learning (6)

Big data analytics (6)

Disciplinary Electives (12 credits)

STAT4609

At least 12 credits selected from the following courses:

COMP3250 Design and analysis of algorithms (6)

COMP3270 Artificial intelligence (6)
COMP3323 Advanced database systems (6)

COMP3407 Scientific computing (6)
MATH3408 Computational methods and differential equations with

applications (6)

MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3901 Operations research I (6)
STAT3616 Advanced SAS programming (6)

[previous title: Data mining (6)]

STAT3620 Modern nonparametric statistics (6) Statistical data analysis (6) STAT3621 Data visualization (6) STAT3622

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses: Directed studies in statistics (6) STAT3799

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) Statistics project (12) STAT4799

Notes:

1. Students may consider taking the following courses if they wish to pursue a more focused study in the following areas:

a. Biomedical Analytics

BIOL4417 'Omics' and systems biology STAT3607 Statistics in clinical medicine and bio-medical research

STAT3608 Statistical genetics

STAT3620 Modern nonparametric statistics

STAT3621 Statistical data analysis

STAT4602 Multivariate data analysis

b. Financial and Risk Analytics

STAT3616 Advanced SAS programming

STAT3621 Statistical data analysis

STAT4601 Time series analysis

Plus advanced level courses listed for the Major in Risk Management

c. Operational Analytics

COMP3250 Design and analysis of algorithms

MATH3600 Discrete mathematics

MATH3901 Operations research I

MATH3943 Network models in operations research

MATH4902 Operations research II

STAT3606 Business logistics

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 5. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at http://www.scifac.hku.hk/ug/current/bsc/curriculum/overlapping-course-req.

Offered to students 2016

admitted to Year 1 in

Objectives:

Amidst an upsurge of digital data produced worldwide nowadays, the Major in Decision Analytics aims to equip students with the skills and expertise in leveraging and managing big data in real time, and provide them with solid training in making digitized information a strategic part of critical decision-making and resource allocation with greater clarity and accuracy. Core courses in the curriculum emphasize the fundamental concepts and methodologies of decision analytics which include but not limited to statistical analysis, data mining and data visualization, programming, data structuring, mathematical and statistical modelling and implementation of database systems. Elective courses focus on diverse and applied techniques of decision analytics in multidisciplinary fields.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the concepts of decision analytics and its underlying theory in relation to a broad range of related disciplinary academic or professional areas (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: identify and adopt appropriate analytical techniques and tools to extract and classify critical information from structured or unstructured data (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
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Impermissible Combinations:

BEng in Computer Science

Major in Computing and Data Analytics

Major in Computer Science

Minor in Computer Science

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

COMP1117 Computer programming (6)

COMP2119 Introduction to data structures and algorithms (6)

MATH1013 University mathematics II (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (30 credits)

COMP3278 Introduction to database management systems (6)

MATH3904 Introduction to optimization (6) STAT3600 Linear statistical analysis (6) STAT3612 Statistical machine learning (6)

Big data analytics (6)

Disciplinary Electives (12 credits)

STAT4609

At least 12 credits selected from the following courses:

COMP3250 Design and analysis of algorithms (6)

COMP3270 Artificial intelligence (6)
COMP3323 Advanced database systems (6)

COMP3407 Scientific computing (6)
MATH3408 Computational methods and differential e

Computational methods and differential equations with applications (6)

MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3901 Operations research I (6)
STAT3616 Advanced SAS programming (6)

[previous title: Data mining (6)]

STAT3620 Modern nonparametric statistics (6) Statistical data analysis (6) STAT3621 Data visualization (6) STAT3622

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses: Directed studies in statistics (6) STAT3799

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) Statistics project (12) STAT4799

Notes:

1. Students may consider taking the following courses if they wish to pursue a more focused study in the following areas:

a. Biomedical Analytics

BIOL4417 'Omics' and systems biology STAT3607 Statistics in clinical medicine and bio-medical research

STAT3608 Statistical genetics

STAT3620 Modern nonparametric statistics

STAT3621 Statistical data analysis

STAT4602 Multivariate data analysis

b. Financial and Risk Analytics

STAT3616 Advanced SAS programming

STAT3621 Statistical data analysis

STAT4601 Time series analysis

Plus advanced level courses listed for the Major in Risk Management

c. Operational Analytics

COMP3250 Design and analysis of algorithms

MATH3600 Discrete mathematics

MATH3901 Operations research I

MATH3943 Network models in operations research

MATH4902 Operations research II

STAT3606 Business logistics

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at http://www.scifac.hku.hk/ug/current/bsc/curriculum/overlapping-course-req.

Offered to students 2015

admitted to Year 1 in

Objectives:

Amidst an upsurge of digital data produced worldwide nowadays, the Major in Decision Analytics aims to equip students with the skills and expertise in leveraging and managing big data in real time, and provide them with solid training in making digitized information a strategic part of critical decision-making and resource allocation with greater clarity and accuracy. Core courses in the curriculum emphasize the fundamental concepts and methodologies of decision analytics which include but not limited to statistical analysis, data mining and data visualization, programming, data structuring, mathematical and statistical modelling and implementation of database systems. Elective courses focus on diverse and applied techniques of decision analytics in multidisciplinary fields.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the concepts of decision analytics and its underlying theory in relation to a broad range of related disciplinary academic or professional areas (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: identify and adopt appropriate analytical techniques and tools to extract and classify critical information from structured or unstructured data (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: be proficient with the design and implementation of advanced modelling techniques and database management, and offer effective recommendations for analytic initiatives and solutions (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: evaluate the quality of information from different sources in support of critical decision making, process streamlining and the optimization of resources, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate to people effectively and efficiently with professionalism and accuracy using interactive and dynamic tools to translate technical information and present collaborative and strategic ideas (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: gain insights into current advances in decision analytics and confidence to solve real-life problems through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

BEng in Computer Science

Major in Computing and Data Analytics

Major in Computer Science

Minor in Computer Science

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

COMP1117 Computer programming (6)

COMP2119 Introduction to data structures and algorithms (6)

MATH1013 University mathematics II (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (30 credits)

COMP3278 Introduction to database management systems (6)

MATH3904 Introduction to optimization (6) STAT3600 Linear statistical analysis (6) STAT3612 Statistical machine learning (6)

Big data analytics (6)

Disciplinary Electives (12 credits)

STAT4609

At least 12 credits selected from the following courses:

COMP3250 Design and analysis of algorithms (6)

COMP3270 Artificial intelligence (6)
COMP3323 Advanced database systems (6)

COMP3407 Scientific computing (6)
MATH3408 Computational methods and differential equations with

applications (6)

MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3901 Operations research I (6)
STAT3616 Advanced SAS programming (6)

[previous title: Data mining (6)]

STAT3620 Modern nonparametric statistics (6) Statistical data analysis (6) STAT3621 Data visualization (6) STAT3622

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses: Directed studies in statistics (6) STAT3799

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) Statistics project (12) STAT4799

Notes:

1. Students may consider taking the following courses if they wish to pursue a more focused study in the following areas:

a. Biomedical Analytics

BIOL4417 'Omics' and systems biology STAT3607 Statistics in clinical medicine and bio-medical research

STAT3608 Statistical genetics

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STAT4602 Multivariate data analysis

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STAT3616 Advanced SAS programming

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STAT4601 Time series analysis

Plus advanced level courses listed for the Major in Risk Management

c. Operational Analytics

COMP3250 Design and analysis of algorithms

MATH3600 Discrete mathematics

MATH3901 Operations research I

MATH3943 Network models in operations research

MATH4902 Operations research II

STAT3606 Business logistics

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Offered to students 2014

admitted to Year 1 in

Objectives:

Amidst an upsurge of digital data produced worldwide nowadays, the Major in Decision Analytics aims to equip students with the skills and expertise in leveraging and managing big data in real time, and provide them with solid training in making digitized information a strategic part of critical decision-making and resource allocation with greater clarity and accuracy. Core courses in the curriculum emphasize the fundamental concepts and methodologies of decision analytics which include but not limited to statistical analysis, data mining and data visualization, programming, data structuring, mathematical and statistical modelling and implementation of database systems. Elective courses focus on diverse and applied techniques of decision analytics in multidisciplinary fields.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the concepts of decision analytics and its underlying theory in relation to a broad range of related disciplinary academic or professional areas (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
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- PLO 6: gain insights into current advances in decision analytics and confidence to solve real-life problems through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

BEng in Computer Science

Major in Computing and Data Analytics

Major in Computer Science

Minor in Computer Science

Major in Risk Management

Major in Statistics Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

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2. Advanced level courses (42 credits)

Disciplinary Core Courses (30 credits)

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Disciplinary Electives (12 credits)

STAT4609

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MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3901 Operations research I (6)
STAT3616 Advanced SAS programming (6)

[previous title: Data mining (6)]

STAT3620 Modern nonparametric statistics (6) Statistical data analysis (6) STAT3621 Data visualization (6) STAT3622

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses: Directed studies in statistics (6) STAT3799

STAT4710 Capstone experience for statistics undergraduates (6)

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STAT3616 Advanced SAS programming

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Plus advanced level courses listed for the Major in Risk Management

c. Operational Analytics

COMP3250 Design and analysis of algorithms

MATH3600 Discrete mathematics

MATH3901 Operations research I

MATH3943 Network models in operations research

MATH4902 Operations research II

STAT3606 Business logistics

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Offered to students 2013

admitted to Year 1 in

Objectives:

Amidst an upsurge of digital data produced worldwide nowadays, the Major in Decision Analytics aims to equip students with the skills and expertise in leveraging and managing big data in real time, and provide them with solid training in making digitized information a strategic part of critical decision-making and resource allocation with greater clarity and accuracy. Core courses in the curriculum emphasize the fundamental concepts and methodologies of decision analytics which include but not limited to statistical analysis, data mining and data visualization, programming, data structuring, mathematical and statistical modelling and implementation of database systems. Elective courses focus on diverse and applied techniques of decision analytics in multidisciplinary fields.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the concepts of decision analytics and its underlying theory in relation to a broad range of related disciplinary academic or professional areas (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
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Impermissible Combinations:

BEng in Computer Science

Major in Computing and Data Analytics

Major in Computer Science

Minor in Computer Science

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

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Big data analytics (6)

Disciplinary Electives (12 credits)

STAT4609

At least 12 credits selected from the following courses:

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COMP3270 Artificial intelligence (6)
COMP3323 Advanced database systems (6)

COMP3407 Scientific computing (6)
MATH3408 Computational methods and differential equations with

applications (6)

MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3901 Operations research I (6)
STAT3616 Advanced SAS programming (6)

[previous title: Data mining (6)]

STAT3620 Modern nonparametric statistics (6) Statistical data analysis (6) STAT3621 Data visualization (6) STAT3622

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses: Directed studies in statistics (6) STAT3799

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) Statistics project (12) STAT4799

Notes:

1. Students may consider taking the following courses if they wish to pursue a more focused study in the following areas:

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STAT3616 Advanced SAS programming

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STAT4601 Time series analysis

Plus advanced level courses listed for the Major in Risk Management

c. Operational Analytics

COMP3250 Design and analysis of algorithms

MATH3600 Discrete mathematics

MATH3901 Operations research I

MATH3943 Network models in operations research

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STAT3606 Business logistics

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Offered to students 2012

admitted to Year 1 in

Objectives:

Amidst an upsurge of digital data produced worldwide nowadays, the Major in Decision Analytics aims to equip students with the skills and expertise in leveraging and managing big data in real time, and provide them with solid training in making digitized information a strategic part of critical decision-making and resource allocation with greater clarity and accuracy. Core courses in the curriculum emphasize the fundamental concepts and methodologies of decision analytics which include but not limited to statistical analysis, data mining and data visualization, programming, data structuring, mathematical and statistical modelling and implementation of database systems. Elective courses focus on diverse and applied techniques of decision analytics in multidisciplinary fields.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the concepts of decision analytics and its underlying theory in relation to a broad range of related disciplinary academic or professional areas (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: identify and adopt appropriate analytical techniques and tools to extract and classify critical information from structured or unstructured data (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
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Impermissible Combinations:

BEng in Computer Science

Major in Computing and Data Analytics

Major in Computer Science

Minor in Computer Science

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

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Disciplinary Core Courses (36 credits)

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COMP2119 Introduction to data structures and algorithms (6)

MATH1013 University mathematics II (6)

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Disciplinary Core Courses (30 credits)

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MATH3904 Introduction to optimization (6) STAT3600 Linear statistical analysis (6) STAT3612 Statistical machine learning (6)

Big data analytics (6)

Disciplinary Electives (12 credits)

STAT4609

At least 12 credits selected from the following courses:

COMP3250 Design and analysis of algorithms (6)

COMP3270 Artificial intelligence (6)
COMP3323 Advanced database systems (6)

COMP3407 Scientific computing (6)
MATH3408 Computational methods and differential equations with

applications (6)

MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3901 Operations research I (6)
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[previous title: Data mining (6)]

STAT3620 Modern nonparametric statistics (6) Statistical data analysis (6) STAT3621 Data visualization (6) STAT3622

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses: Directed studies in statistics (6) STAT3799

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) Statistics project (12) STAT4799

Notes:

1. Students may consider taking the following courses if they wish to pursue a more focused study in the following areas:

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BIOL4417 'Omics' and systems biology STAT3607 Statistics in clinical medicine and bio-medical research

STAT3608 Statistical genetics

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STAT3621 Statistical data analysis

STAT4602 Multivariate data analysis

b. Financial and Risk Analytics

STAT3616 Advanced SAS programming

STAT3621 Statistical data analysis

STAT4601 Time series analysis

Plus advanced level courses listed for the Major in Risk Management

c. Operational Analytics

COMP3250 Design and analysis of algorithms

MATH3600 Discrete mathematics

MATH3901 Operations research I

MATH3943 Network models in operations research

MATH4902 Operations research II

STAT3606 Business logistics

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Major Title Major in Earth System Science

Offered to students 2020

admitted to Year 1 in

Objectives:

Earth System Science seeks to understand the Earth as an integrated system, including its past, present and future behaviour, from the environments where life evolves on the surface to the interactions between the crust and its fluid envelopes (atmosphere and hydrosphere), with interests extending to the Earth's interior. Core courses in the major focus on understanding the composition, structure and processes of the solid earth, the hydrosphere and the atmosphere, and their interactions. Students will be equipped with knowledge to help manage geological resources and natural hazards. Throughout the curriculum there is consistent emphasis on transferable skills, learning through fieldwork, laboratory studies and research based classes, designed to enhance students' ability to think critically, to communicate effectively and to develop solutions to complex problems. Graduates from the major can pursue further studies in the Earth Sciences and careers in a wide variety of geoscience-related areas including resource management, hazard mitigation, soil and water conservation and teaching.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the key concepts of the Earth System components and processes (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: have acquired the ability to observe, describe, measure and analyze principal phenomena of earth processes and the interactions between different earth components (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: provide expertise to maintain geological environments and prevent severe perturbations due to resource exploitation and water disposal (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: equip with the knowledge and skills to better predict and deal with geological and related hazards such as earthquakes, landslides, tsunamis, floods and volcanic eruptions, and recognize and appraise the related ethical issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: identify real life problems pertaining to the physical environment and find solutions to those problems (by means capstone learning experience in the form of internship, field learning, and project-based learning in the curriculum)
- PLO 6: work with other students and possess an adequate level of communication skills (by means of group project learning and presentation opportunities in the curriculum)

Impermissible Combinations:

Minor in Earth Sciences

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) SCNC1111 Scientific method and reasoning (6)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

EASC1401 Blue Planet (6)

EASC1406 Introduction to the earth-life system (6)
EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field and laboratory methods (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)
EASC2410 Data analysis and modeling in earth sciences (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (6 credits)

EASC4403 Biogeochemical cycles (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from Lists A and B, among which at least 18 credits from List A:

Reconstruction of past climate (6)

List A

EASC3410 Hydrogeology (6) EASC3415 Meteorology (6)

EASC3418 Coasts and coastal change (6)
ENVS3313 Environmental oceanography (6)

List B

EASC3406

EASC3020 Global change: anthropogenic impacts (6)
EASC3403 Sedimentary environments (6)
EASC3405 Environmental remote sensing (6)

EASC3412 Earth resources (6) EASC3417 Earth through time (6)

EASC3417

EAST through time (o)

EASC3419

Earth System Science Field Studies (6)

EASC3999

Directed studies in earth sciences (6)

ENVS3007

Natural hazards and mitigation (6)

EASC4408

Special topics in earth sciences (6)

EASC4999

Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4911 Earth system: contemporary issues (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second

major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students are recommended to take additional chemistry and/or physics courses above the introductory level if they are interested in postgraduate research in Earth System Science.
- 5. Students are recommended to take PHYS1240 Physics by Inquiry and CHEM1041 Foundations of Chemistry if they do not have level 3 or above in HKDSE Physics and Chemistry, respectively, or equivalent.
- 6. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Major Title Major in Earth System Science

Offered to students 2019

admitted to Year 1 in

Objectives:

Earth System Science seeks to understand the Earth as an integrated system, including its past, present and future behaviour, from the environments where life evolves on the surface to the interactions between the crust and its fluid envelopes (atmosphere and hydrosphere), with interests extending to the Earth's interior. Core courses in the major focus on understanding the composition, structure and processes of the solid earth, the hydrosphere and the atmosphere, and their interactions. Students will be equipped with knowledge to help manage geological resources and natural hazards. Throughout the curriculum there is consistent emphasis on transferable skills, learning through fieldwork, laboratory studies and research based classes, designed to enhance students' ability to think critically, to communicate effectively and to develop solutions to complex problems. Graduates from the major can pursue further studies in the Earth Sciences and careers in a wide variety of geoscience-related areas including resource management, hazard mitigation, soil and water conservation and teaching.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the key concepts of the Earth System components and processes (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: have acquired the ability to observe, describe, measure and analyze principal phenomena of earth processes and the interactions between different earth components (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: provide expertise to maintain geological environments and prevent severe perturbations due to resource exploitation and water disposal (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: equip with the knowledge and skills to better predict and deal with geological and related hazards such as earthquakes, landslides, tsunamis, floods and volcanic eruptions, and recognize and appraise the related ethical issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: identify real life problems pertaining to the physical environment and find solutions to those problems (by means capstone learning experience in the form of internship, field learning, and project-based learning in the curriculum)
- PLO 6: work with other students and possess an adequate level of communication skills (by means of group project learning and presentation opportunities in the curriculum)

Impermissible Combinations:

Minor in Earth Sciences

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) SCNC1111 Scientific method and reasoning (6)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

EASC1401 Blue Planet (6)

EASC1406 Introduction to the earth-life system (6)
EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field and laboratory methods (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)
EASC2410 Data analysis and modeling in earth sciences (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (6 credits)

EASC4403 Biogeochemical cycles (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from Lists A and B, among which at least 18 credits from List A:

Reconstruction of past climate (6)

List A

EASC3410 Hydrogeology (6) EASC3415 Meteorology (6)

EASC3418 Coasts and coastal change (6)
ENVS3313 Environmental oceanography (6)

List B

EASC3406

EASC3020 Global change: anthropogenic impacts (6)
EASC3403 Sedimentary environments (6)
EASC3405 Environmental remote sensing (6)

EASC3412 Earth resources (6) EASC3417 Earth through time (6)

EASC3417

EAST through time (o)

EASC3419

Earth System Science Field Studies (6)

EASC3999

Directed studies in earth sciences (6)

ENVS3007

Natural hazards and mitigation (6)

EASC4408

Special topics in earth sciences (6)

EASC4999

Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4911 Earth system: contemporary issues (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second

major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students are recommended to take additional chemistry and/or physics courses above the introductory level if they are interested in postgraduate research in Earth System Science.
- 6. Students are recommended to take PHYS1240 Physics by Inquiry and CHEM1041 Foundations of Chemistry if they do not have level 3 or above in HKDSE Physics and Chemistry, respectively, or equivalent.

Remarks

Major Title Major in Earth System Science

Offered to students 2018

admitted to Year 1 in

Objectives:

Earth System Science seeks to understand the Earth as an integrated system, including its past, present and future behaviour, from the environments where life evolves on the surface to the interactions between the crust and its fluid envelopes (atmosphere and hydrosphere), with interests extending to the Earth's interior. Core courses in the major focus on understanding the composition, structure and processes of the solid earth, the hydrosphere and the atmosphere, and their interactions. Students will be equipped with knowledge to help manage geological resources and natural hazards. Throughout the curriculum there is consistent emphasis on transferable skills, learning through fieldwork, laboratory studies and research based classes, designed to enhance students' ability to think critically, to communicate effectively and to develop solutions to complex problems. Graduates from the major can pursue further studies in the Earth Sciences and careers in a wide variety of geoscience-related areas including resource management, hazard mitigation, soil and water conservation and teaching.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the key concepts of the Earth System components and processes (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: have acquired the ability to observe, describe, measure and analyze principal phenomena of earth processes and the interactions between different earth components (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: provide expertise to maintain geological environments and prevent severe perturbations due to resource exploitation and water disposal (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: equip with the knowledge and skills to better predict and deal with geological and related hazards such as earthquakes, landslides, tsunamis, floods and volcanic eruptions, and recognize and appraise the related ethical issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: identify real life problems pertaining to the physical environment and find solutions to those problems (by means capstone learning experience in the form of internship, field learning, and project-based learning in the curriculum)
- PLO 6: work with other students and possess an adequate level of communication skills (by means of group project learning and presentation opportunities in the curriculum)

Impermissible Combinations:

Minor in Earth Sciences

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)
SCNC1111 Scientific method and reasoning (6)
SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

EASC1401 Blue Planet (6)

EASC1406 Introduction to the earth-life system (6)
EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field and laboratory methods (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)
EASC2410 Data analysis and modeling in earth sciences (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (6 credits)

EASC4403 Biogeochemical cycles (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from Lists A and B, among which at least 18 credits from List A:

List A

EASC3410 Hydrogeology (6) EASC3415 Meteorology (6)

EASC3418 Coasts and coastal change (6)
ENVS3313 Environmental oceanography (6)

List B

EASC3020 Global change: anthropogenic impacts (6)
EASC3403 Sedimentary environments (6)
EASC3405 Environmental remote sensing (6)

EASC3406 Reconstruction of past climate (6)
EASC3412 Earth resources (6)

EASC3417

EASC3417 Earth through time (6)
EASC3419 Earth System Science Field Studies (6)
EASC3999 Directed studies in earth sciences (6)
ENVS3007 Natural hazards and mitigation (6)
EASC4408 Special topics in earth sciences (6)
EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4911 Earth system: contemporary issues (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second

major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students are recommended to take additional chemistry and/or physics courses above the introductory level if they are interested in postgraduate research in Earth System Science.
- 6. Students are recommended to take PHYS1240 Physics by Inquiry and CHEM1041 Foundations of Chemistry if they do not have level 3 or above in HKDSE Physics and Chemistry, respectively, or equivalent.

Remarks

Major Title Major in Earth System Science

Offered to students 2017

admitted to Year 1 in

Objectives:

Earth System Science seeks to understand the Earth as an integrated system, including its past, present and future behaviour, from the environments where life evolves on the surface to the interactions between the crust and its fluid envelopes (atmosphere and hydrosphere), with interests extending to the Earth's interior. Core courses in the major focus on understanding the composition, structure and processes of the solid earth, the hydrosphere and the atmosphere, and their interactions. Students will be equipped with knowledge to help manage geological resources and natural hazards. Throughout the curriculum there is consistent emphasis on transferable skills, learning through fieldwork, laboratory studies and research based classes, designed to enhance students' ability to think critically, to communicate effectively and to develop solutions to complex problems. Graduates from the major can pursue further studies in the Earth Sciences and careers in a wide variety of geoscience-related areas including resource management, hazard mitigation, soil and water conservation and teaching.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the key concepts of the Earth System components and processes (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: have acquired the ability to observe, describe, measure and analyze principal phenomena of earth processes and the interactions between different earth components (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: provide expertise to maintain geological environments and prevent severe perturbations due to resource exploitation and water disposal (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: equip with the knowledge and skills to better predict and deal with geological and related hazards such as earthquakes, landslides, tsunamis, floods and volcanic eruptions, and recognize and appraise the related ethical issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: identify real life problems pertaining to the physical environment and find solutions to those problems (by means capstone learning experience in the form of internship, field learning, and project-based learning in the curriculum)
- PLO 6: work with other students and possess an adequate level of communication skills (by means of group project learning and presentation opportunities in the curriculum)

Impermissible Combinations:

Minor in Earth Sciences

SCNC1112

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) SCNC1111 Scientific method and reasoning (6)

Disciplinary Core Courses (36 credits)

EASC1401 Blue Planet (6)

EASC1406 Introduction to the earth-life system (6)
EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field and laboratory methods (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)
EASC2410 Data analysis and modeling in earth sciences (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (6 credits)

EASC4403 Biogeochemical cycles (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from Lists A and B, among which at least 18 credits from List A:

Fundamentals of modern science (6)

List A

EASC3410 Hydrogeology (6) EASC3415 Meteorology (6)

EASC3418 Coasts and coastal change (6)
ENVS3313 Environmental oceanography (6)

List B

EASC3020 Global change: anthropogenic impacts (6)
EASC3403 Sedimentary environments (6)
EASC3405 Environmental remote sensing (6)

EASC3406 Reconstruction of past climate (6)
EASC3412 Earth resources (6)

EASC3417

EASC3417 Earth through time (6)
EASC3419 Earth System Science Field Studies (6)
EASC3999 Directed studies in earth sciences (6)
ENVS3007 Natural hazards and mitigation (6)
EASC4408 Special topics in earth sciences (6)
EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4911 Earth system: contemporary issues (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second

major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students are recommended to take additional chemistry and/or physics courses above the introductory level if they are interested in postgraduate research in Earth System Science.
- 6. Students are recommended to take PHYS1240 Physics by Inquiry and CHEM1041 Foundations of Chemistry if they do not have level 3 or above in HKDSE Physics and Chemistry, respectively, or equivalent.

Remarks:

Major Title Major in Earth System Science

Offered to students 2016

admitted to Year 1 in

Objectives:

Earth System Science seeks to understand the Earth as an integrated system, including its past, present and future behaviour, from the environments where life evolves on the surface to the interactions between the crust and its fluid envelopes (atmosphere and hydrosphere), with interests extending to the Earth's interior. Core courses in the major focus on understanding the composition, structure and processes of the solid earth, the hydrosphere and the atmosphere, and their interactions. Students will be equipped with knowledge to help manage geological resources and natural hazards. Throughout the curriculum there is consistent emphasis on transferable skills, learning through fieldwork, laboratory studies and research based classes, designed to enhance students' ability to think critically, to communicate effectively and to develop solutions to complex problems. Graduates from the major can pursue further studies in the Earth Sciences and careers in a wide variety of geoscience-related areas including resource management, hazard mitigation, soil and water conservation and teaching.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the key concepts of the Earth System components and processes (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: have acquired the ability to observe, describe, measure and analyze principal phenomena of earth processes and the interactions between different earth components (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: provide expertise to maintain geological environments and prevent severe perturbations due to resource exploitation and water disposal (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: equip with the knowledge and skills to better predict and deal with geological and related hazards such as earthquakes, landslides, tsunamis, floods and volcanic eruptions, and recognize and appraise the related ethical issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: identify real life problems pertaining to the physical environment and find solutions to those problems (by means capstone learning experience in the form of internship, field learning, and project-based learning in the curriculum)
- PLO 6: work with other students and possess an adequate level of communication skills (by means of group project learning and presentation opportunities in the curriculum)

Impermissible Combinations:

Minor in Earth Sciences

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

EASC1401 Blue Planet (6)
EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field and laboratory methods (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)

EASC1406 Introduction to the earth-life system (6)

2. Advanced level courses (42 credits) Disciplinary Core Courses (6 credits)

EASC4403 Biogeochemical cycles (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from Lists A and B, among which at least 12 credits from List A:

List A

EASC3410 Hydrogeology (6) EASC3415 Meteorology (6)

ENVS3313 Environmental oceanography (6)

List B

EASC3403 Sedimentary environments (6)
EASC3405 Environmental remote sensing (6)
EASC3406 Reconstruction of past climate (6)
EASC3408 Geophysics (6)

EASC3412 Earth resources (6)
EASC3416 Advanced geochem

EASC3416 Advanced geochemistry and geochronology (6)

EASC3417 Earth through time (6)

EASC3999 Directed studies in earth sciences (6)
ENVS3007 Natural hazards and mitigation (6)
EASC4408 Special topics in earth sciences (6)
EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4911 Earth system: contemporary issues (6)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 5. Students are recommended to take additional chemistry and/or physics courses above the introductory level if they are interested in postgraduate research in Earth System Science.

Remarks

Major Title Major in Earth System Science

Offered to students 2015

admitted to Year 1 in

Objectives:

Earth System Science seeks to understand the Earth as an integrated system, including its past, present and future behaviour, from the environments where life evolves on the surface to the interactions between the crust and its fluid envelopes (atmosphere and hydrosphere), with interests extending to the Earth's interior. Core courses in the major focus on understanding the composition, structure and processes of the solid earth, the hydrosphere and the atmosphere, and their interactions. Students will be equipped with knowledge to help manage geological resources and natural hazards. Throughout the curriculum there is consistent emphasis on transferable skills, learning through fieldwork, laboratory studies and research based classes, designed to enhance students' ability to think critically, to communicate effectively and to develop solutions to complex problems. Graduates from the major can pursue further studies in the Earth Sciences and careers in a wide variety of geoscience-related areas including resource management, hazard mitigation, soil and water conservation and teaching.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the key concepts of the Earth System components and processes (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: have acquired the ability to observe, describe, measure and analyze principal phenomena of earth processes and the interactions between different earth components (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: provide expertise to maintain geological environments and prevent severe perturbations due to resource exploitation and water disposal (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: equip with the knowledge and skills to better predict and deal with geological and related hazards such as earthquakes, landslides, tsunamis, floods and volcanic eruptions, and recognize and appraise the related ethical issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: identify real life problems pertaining to the physical environment and find solutions to those problems (by means capstone learning experience in the form of internship, field learning, and project-based learning in the curriculum)
- PLO 6: work with other students and possess an adequate level of communication skills (by means of group project learning and presentation opportunities in the curriculum)

Impermissible Combinations:

Minor in Earth Sciences

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)
SCNC1111 Scientific method and reasoning (6)
SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

EASC1401 Blue Planet (6)
EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field and laboratory methods (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)

EASC1406 Introduction to the earth-life system (6)

2. Advanced level courses (42 credits)
Disciplinary Core Courses (6 credits)

EASC4403 Biogeochemical cycles (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from Lists A and B, among which at least 12 credits from List A:

List A

EASC3410 Hydrogeology (6) EASC3415 Meteorology (6)

ENVS3313 Environmental oceanography (6)

List B

EASC3403 Sedimentary environments (6)
EASC3405 Environmental remote sensing (6)
EASC3406 Reconstruction of past climate (6)
EASC3408 Geophysics (6)

EASC3412 Earth resources (6)
FASC3416 Advanced geochem

EASC3416 Advanced geochemistry and geochronology (6)

EASC3417 Earth through time (6)

EASC3999 Directed studies in earth sciences (6)
ENVS3007 Natural hazards and mitigation (6)
EASC4408 Special topics in earth sciences (6)
EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4911 Earth system: contemporary issues (6)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 5. Students are recommended to take additional chemistry and/or physics courses above the introductory level if they are interested in postgraduate research in Earth System Science.

Remarks

Major Title Major in Earth System Science

Offered to students 2014

admitted to Year 1 in

Objectives:

Earth System Science seeks to understand the Earth as an integrated system, including its past, present and future behaviour, from the environments where life evolves on the surface to the interactions between the crust and its fluid envelopes (atmosphere and hydrosphere), with interests extending to the Earth's interior. Core courses in the major focus on understanding the composition, structure and processes of the solid earth, the hydrosphere and the atmosphere, and their interactions. Students will be equipped with knowledge to help manage geological resources and natural hazards. Throughout the curriculum there is consistent emphasis on transferable skills, learning through fieldwork, laboratory studies and research based classes, designed to enhance students' ability to think critically, to communicate effectively and to develop solutions to complex problems. Graduates from the major can pursue further studies in the Earth Sciences and careers in a wide variety of geoscience-related areas including resource management, hazard mitigation, soil and water conservation and teaching.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the key concepts of the Earth System components and processes (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: have acquired the ability to observe, describe, measure and analyze principal phenomena of earth processes and the interactions between different earth components (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: provide expertise to maintain geological environments and prevent severe perturbations due to resource exploitation and water disposal (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: equip with the knowledge and skills to better predict and deal with geological and related hazards such as earthquakes, landslides, tsunamis, floods and volcanic eruptions, and recognize and appraise the related ethical issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: identify real life problems pertaining to the physical environment and find solutions to those problems (by means capstone learning experience in the form of internship, field learning, and project-based learning in the curriculum)
- PLO 6: work with other students and possess an adequate level of communication skills (by means of group project learning and presentation opportunities in the curriculum)

Impermissible Combinations:

Minor in Earth Sciences

FASC2404

Required courses (96 credits) 1. Introductory level courses (48 credits) **Disciplinary Core Courses: Science Foundation Courses (12 credits)** Scientific method and reasoning (6) SCNC1111 Fundamentals of modern science (6) SCNC1112 **Disciplinary Core Courses (36 credits)** Evolutionary diversity (6) BIOL1309 Blue Planet (6) EASC1401 EASC1402 Principles of geology (6) EASC2401 Fluid/solid interactions in earth processes (6) EASC2402 Field and laboratory methods (6) Introduction to atmosphere and hydrosphere (6)

2. Advanced level courses (42 credits) **Disciplinary Core Courses (6 credits)**

EASC4403 Biogeochemical cycles (6)

Disciplinary Electives (36 credits)

At least 36 credits from Lists A and B, among which at least 12 credits from List A:

List A EASC3410 Hydrogeology (6) Meteorology (6) EASC3415 ENVS3313 Environmental oceanography (6) List R Sedimentary environments (6) EASC3403

EASC3405 Environmental remote sensing (6) Reconstruction of past climate (6) EASC3406 EASC3408 Geophysics (6)

Earth resources (6) FASC3412 EASC3416

Advanced geochemistry and geochronology (6)

Earth through time (6) EASC3417 Directed studies in earth sciences (6) FASC3999

ENVS3007 Natural hazards and mitigation (6) EASC4408 Special topics in earth sciences (6) EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4911 Earth system: contemporary issues (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112

Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 5. Students are recommended to take additional chemistry and/or physics courses above the introductory level if they are interested in postgraduate research in Earth System Science.

Remarks:

Major Title Major in Earth System Science

Offered to students 2013

admitted to Year 1 in

Objectives:

Earth System Science seeks to understand the Earth as an integrated system, including its past, present and future behaviour, from the environments where life evolves on the surface to the interactions between the crust and its fluid envelopes (atmosphere and hydrosphere), with interests extending to the Earth's interior. Core courses in the major focus on understanding the composition, structure and processes of the solid earth, the hydrosphere and the atmosphere, and their interactions. Students will be equipped with knowledge to help manage geological resources and natural hazards. Throughout the curriculum there is consistent emphasis on transferable skills, learning through fieldwork, laboratory studies and research based classes, designed to enhance students' ability to think critically, to communicate effectively and to develop solutions to complex problems. Graduates from the major can pursue further studies in the Earth Sciences and careers in a wide variety of geoscience-related areas including resource management, hazard mitigation, soil and water conservation and teaching.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the key concepts of the Earth System components and processes (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: have acquired the ability to observe, describe, measure and analyze principal phenomena of earth processes and the interactions between different earth components (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: provide expertise to maintain geological environments and prevent severe perturbations due to resource exploitation and water disposal (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: equip with the knowledge and skills to better predict and deal with geological and related hazards such as earthquakes, landslides, tsunamis, floods and volcanic eruptions, and recognize and appraise the related ethical issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: identify real life problems pertaining to the physical environment and find solutions to those problems (by means capstone learning experience in the form of internship, field learning, and project-based learning in the curriculum)
- PLO 6: work with other students and possess an adequate level of communication skills (by means of group project learning and presentation opportunities in the curriculum)

Impermissible Combinations:

Minor in Earth Sciences Required courses (96 credits) 1. Introductory level courses (48 credits) **Disciplinary Core Courses: Science Foundation Courses (12 credits)** Scientific method and reasoning (6) SCNC1111 Fundamentals of modern science (6) **SCNC1112 Disciplinary Core Courses (36 credits)** Evolutionary diversity (6) BIOL1309 EASC1401 Blue Planet (6) EASC1402 Principles of geology (6) EASC2401 Fluid/solid interactions in earth processes (6) EASC2402 Field and laboratory methods (6) Introduction to atmosphere and hydrosphere (6) FASC2404

2. Advanced level courses (42 credits) **Disciplinary Core Courses (6 credits)**

EASC4403 Biogeochemical cycles (6)

Disciplinary Electives (36 credits)

At least 36 credits from Lists A and B, among which at least 12 credits from List A:

List A EASC3410 Hydrogeology (6) Meteorology (6) EASC3415 ENVS3313 Environmental oceanography (6) List R Sedimentary environments (6) EASC3403 EASC3405 Environmental remote sensing (6) Reconstruction of past climate (6) EASC3406 EASC3408 Geophysics (6) Earth resources (6) FASC3412 Advanced geochemistry and geochronology (6) EASC3416 Earth through time (6) EASC3417

Directed studies in earth sciences (6) FASC3999 ENVS3007 Natural hazards and mitigation (6) EASC4408 Special topics in earth sciences (6) EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4911 Earth system: contemporary issues (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112

Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 5. Students are recommended to take additional chemistry and/or physics courses above the introductory level if they are interested in postgraduate research in Earth System Science.

Remarks:

Major Title Major in Earth System Science

Offered to students 2012

admitted to Year 1 in

Objectives:

Earth System Science seeks to understand the Earth as an integrated system, including its past, present and future behaviour, from the environments where life evolves on the surface to the interactions between the crust and its fluid envelopes (atmosphere and hydrosphere), with interests extending to the Earth's interior. Core courses in the major focus on understanding the composition, structure and processes of the solid earth, the hydrosphere and the atmosphere, and their interactions. Students will be equipped with knowledge to help manage geological resources and natural hazards. Throughout the curriculum there is consistent emphasis on transferable skills, learning through fieldwork, laboratory studies and research based classes, designed to enhance students' ability to think critically, to communicate effectively and to develop solutions to complex problems. Graduates from the major can pursue further studies in the Earth Sciences and careers in a wide variety of geoscience-related areas including resource management, hazard mitigation, soil and water conservation and teaching.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the key concepts of the Earth System components and processes (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: have acquired the ability to observe, describe, measure and analyze principal phenomena of earth processes and the interactions between different earth components (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: provide expertise to maintain geological environments and prevent severe perturbations due to resource exploitation and water disposal (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: equip with the knowledge and skills to better predict and deal with geological and related hazards such as earthquakes, landslides, tsunamis, floods and volcanic eruptions, and recognize and appraise the related ethical issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: identify real life problems pertaining to the physical environment and find solutions to those problems (by means capstone learning experience in the form of internship, field learning, and project-based learning in the curriculum)
- PLO 6: work with other students and possess an adequate level of communication skills (by means of group project learning and presentation opportunities in the curriculum)

Impermissible Combinations:

Minor in Earth Sciences Required courses (96 credits) 1. Introductory level courses (48 credits) **Disciplinary Core Courses: Science Foundation Courses (12 credits)** Scientific method and reasoning (6) SCNC1111 Fundamentals of modern science (6) **SCNC1112 Disciplinary Core Courses (36 credits)** Evolutionary diversity (6) BIOL1309 EASC1401 Blue Planet (6) EASC1402 Principles of geology (6) EASC2401 Fluid/solid interactions in earth processes (6) EASC2402 Field and laboratory methods (6) Introduction to atmosphere and hydrosphere (6) FASC2404 2. Advanced level courses (42 credits) **Disciplinary Core Courses (6 credits)** EASC4403 Biogeochemical cycles (6) **Disciplinary Electives (36 credits)** At least 36 credits from Lists A and B, among which at least 12 credits from List A:

List A: EASC3410 Hydrogeology (6) Meteorology (6) EASC3415 ENVS3313 Environmental oceanography (6) List R Sedimentary environments (6) EASC3403 EASC3405 Environmental remote sensing (6) Reconstruction of past climate (6) EASC3406 EASC3408 Geophysics (6) Earth resources (6) FASC3412 Advanced geochemistry and geochronology (6) EASC3416 Earth through time (6) EASC3417 Directed studies in earth sciences (6) FASC3999

ENVS3007 Natural hazards and mitigation (6) EASC4408 Special topics in earth sciences (6) EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4911 Earth system: contemporary issues (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112

Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 5. Students are recommended to take additional chemistry and/or physics courses above the introductory level if they are interested in postgraduate research in Earth System Science.

Remarks:

Major Title Major in Ecology & Biodiversity

Offered to students 2020

admitted to Year 1 in

Objectives:

This major is directed at teaching students: (1) how organisms interact with each other and their environments, (2) how species are distributed throughout the world, and (3) key threats and approaches to conserving biodiversity. Special reference is made to Hong Kong and Asia; the ways in which humans have impacted upon natural environments; and, the approaches used to manage or ameliorate those impacts. This major is based around an introductory core, which emphasizes plant and animal biology and includes a compulsory week-long residential field trip. Advanced courses in the major teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial and freshwater environments) with an emphasis on field work, introduces the use of statistical and molecular techniques in ecology, and focuses on certain applied topics such as environmental impact assessment, ecotoxicology, fisheries and mariculture, and biodiversity conservation. Students have an opportunity to conduct independent research in ecology and biodiversity as a final year project or a dissertation under the close supervision of an individual staff member. Apart from the fundamental knowledge and skills in understanding and managing biodiversity offered in the core courses of this major, strong emphasis is placed upon experiential learning such as overseas field expedition and work placement in the environmental sector. Biodiversity conservation requires scientific input as well as passion. Through the range of formal field-based courses as well as extra-curricular activities offered, students taking this major will have opportunities to participate in research, field conservation and education projects both locally and internationally. Assistance will be provided so that students can develop expertise in one or a few groups of plants or animals, as familiarity with species identification is an essential prerequisite for biodiversity scientists or conservation biologists.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the regional and global environment, and how they interact; identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to understand, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences (Intensive)

Major in Ecology & Biodiversity (Intensive)

Minor in Ecology & Biodiversity

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2306 Ecology and evolution (6) ENVS2002 Environmental data analysis (6)

2. Advanced level courses (36 credits) Disciplinary Core Courses (18 credits)

BIOL3301 Marine biology (6)

BIOL3302 Systematics and phylogenetics (6) BIOL3319 Tropical terrestrial ecology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3101 Animal behaviour (6) BIOL3303 Conservation biology (6)

BIOL3305 Tropical and temperate marine ecology field course (6)

BIOL3313 Freshwater ecology (6)
BIOL3314 Plant structure and evolution (6)
BIOL3318 Experimental intertidal ecology (6)

BIOL3322	Marine invertebrate zoology (6)
BIOL3328	Nearshore marine and estuarine ecology (6)
BIOL3419	Insect ecology: the little things that run the world (6)
BIOL3506	Evolutionary biology (6)
BIOL4301	Fish and fisheries (6)
BIOL4302	Environmental impact assessment (6)
BIOL4304	Ecosystem functioning and services (6)
BIOL4505	Oyster aquaculture (6)
BIOL4861	Ecology & biodiversity internship (6)
ENVS3019	Urban ecology (6)
ENVS3020	Global change ecology (6)
3. Capstone requir	ement (12 credits)
BIOL4991	Ecology & biodiversity project (12)

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, two 6-credit or a 12-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Major Title Major in Ecology & Biodiversity

Offered to students 2019

admitted to Year 1 in

Objectives:

This major is directed at teaching students: (1) how organisms interact with each other and their environments, (2) how species are distributed throughout the world, and (3) key threats and approaches to conserving biodiversity. Special reference is made to Hong Kong and Asia; the ways in which humans have impacted upon natural environments; and, the approaches used to manage or ameliorate those impacts. This major is based around an introductory core, which emphasizes plant and animal biology and includes a compulsory week-long residential field trip. Advanced courses in the major teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial and freshwater environments) with an emphasis on field work, introduces the use of statistical and molecular techniques in ecology, and focuses on certain applied topics such as environmental impact assessment, ecotoxicology, fisheries and mariculture, and biodiversity conservation. Students have an opportunity to conduct independent research in ecology and biodiversity as a final year project or a dissertation under the close supervision of an individual staff member. Apart from the fundamental knowledge and skills in understanding and managing biodiversity offered in the core courses of this major, strong emphasis is placed upon experiential learning such as overseas field expedition and work placement in the environmental sector. Biodiversity conservation requires scientific input as well as passion. Through the range of formal field-based courses as well as extra-curricular activities offered, students taking this major will have opportunities to participate in research, field conservation and education projects both locally and internationally. Assistance will be provided so that students can develop expertise in one or a few groups of plants or animals, as familiarity with species identification is an essential prerequisite for biodiversity scientists or conservation biologists.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the regional and global environment, and how they interact; identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to understand, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences (Intensive)

Major in Ecology & Biodiversity (Intensive)

Minor in Ecology & Biodiversity

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2306 Ecology and evolution (6)
ENVS2002 Environmental data analysis (6)

2. Advanced level courses (36 credits) Disciplinary Core Courses (18 credits)

BIOL3301 Marine biology (6)

BIOL3302 Systematics and phylogenetics (6) BIOL3319 Tropical terrestrial ecology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3101 Animal behaviour (6) BIOL3303 Conservation biology (6)

BIOL3305 Tropical and temperate marine ecology field course (6)

BIOL3313 Freshwater ecology (6)
BIOL3314 Plant structure and evolution (6)
BIOL3318 Experimental intertidal ecology (6)

BIOL3322	Marine invertebrate zoology (6)
BIOL3328	Nearshore marine and estuarine ecology (6)
BIOL3419	Insect ecology: the little things that run the world (6)
BIOL3506	Evolutionary biology (6)
BIOL4301	Fish and fisheries (6)
BIOL4302	Environmental impact assessment (6)
BIOL4304	Ecosystem functioning and services (6)
BIOL4505	Oyster aquaculture (6)
BIOL4861	Ecology & biodiversity internship (6)
ENVS3019	Urban ecology (6)
ENVS3020	Global change ecology (6)
3. Capstone requi	rement (12 credits)
BIOL4991	Ecology & biodiversity project (12)

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, two 6-credit or a 12-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional two 6-credit or a 12-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Ecology & Biodiversity

Offered to students 2018

admitted to Year 1 in

Objectives:

This major is directed at teaching students: (1) how organisms interact with each other and their environments, (2) how species are distributed throughout the world, and (3) key threats and approaches to conserving biodiversity. Special reference is made to Hong Kong and Asia; the ways in which humans have impacted upon natural environments; and, the approaches used to manage or ameliorate those impacts. This major is based around an introductory core, which emphasizes plant and animal biology and includes a compulsory week-long residential field trip. Advanced courses in the major teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial and freshwater environments) with an emphasis on field work, introduces the use of statistical and molecular techniques in ecology, and focuses on certain applied topics such as environmental impact assessment, ecotoxicology, fisheries and mariculture, and biodiversity conservation. Students have an opportunity to conduct independent research in ecology and biodiversity as a final year project or a dissertation under the close supervision of an individual staff member. Apart from the fundamental knowledge and skills in understanding and managing biodiversity offered in the core courses of this major, strong emphasis is placed upon experiential learning such as overseas field expedition and work placement in the environmental sector. Biodiversity conservation requires scientific input as well as passion. Through the range of formal field-based courses as well as extra-curricular activities offered, students taking this major will have opportunities to participate in research, field conservation and education projects both locally and internationally. Assistance will be provided so that students can develop expertise in one or a few groups of plants or animals, as familiarity with species identification is an essential prerequisite for biodiversity scientists or conservation biologists.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the regional and global environment, and how they interact; identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to understand, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences (Intensive)

Major in Ecology & Biodiversity (Intensive)

Minor in Ecology & Biodiversity

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2306 Ecology and evolution (6) ENVS2002 Environmental data analysis (6)

2. Advanced level courses (42 credits) Disciplinary Core Courses (18 credits)

BIOL3301 Marine biology (6)

BIOL3302 Systematics and phylogenetics (6) BIOL3319 Tropical terrestrial ecology (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3101 Animal behaviour (6) BIOL3303 Conservation biology (6)

BIOL3305 Tropical and temperate marine ecology field course (6)

BIOL3313 Freshwater ecology (6)
BIOL3314 Plant structure and evolution (6)
BIOL3318 Experimental intertidal ecology (6)

BIOL3322	Marine invertebrate zoology (6)			
BIOL3328	Nearshore marine and estuarine ecology (6)			
BIOL3419	Insect ecology: the little things that run the world (6)			
BIOL3506	Evolutionary biology (6)			
BIOL4301	Fish and fisheries (6)			
BIOL4302	Environmental impact assessment (6)			
BIOL4304	Ecosystem functioning and services (6)			
BIOL4505	Oyster aquaculture (6)			
BIOL4861	Ecology & biodiversity internship (6)			
ENVS3019	Urban ecology (6)			
ENVS3020	Global change ecology (6)			
3. Capstone require	3. Capstone requirement (6 credits)			
At least 6 credits	selected from the following courses:			
BIOL3991	Directed studies in ecology & biodiversity (6)			
BIOL4911	Conservation science in practice (6)			
BIOL4991	Ecology & biodiversity project (12)			

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Ecology & Biodiversity

Offered to students 2017

admitted to Year 1 in

Objectives:

This major is directed at teaching students: (1) how organisms interact with each other and their environments, (2) how species are distributed throughout the world, and (3) key threats and approaches to conserving biodiversity. Special reference is made to Hong Kong and Asia; the ways in which humans have impacted upon natural environments; and, the approaches used to manage or ameliorate those impacts. This major is based around an introductory core, which emphasizes plant and animal biology and includes a compulsory week-long residential field trip. Advanced courses in the major teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial and freshwater environments) with an emphasis on field work, introduces the use of statistical and molecular techniques in ecology, and focuses on certain applied topics such as environmental impact assessment, ecotoxicology, fisheries and mariculture, and biodiversity conservation. Students have an opportunity to conduct independent research in ecology and biodiversity as a final year project or a dissertation under the close supervision of an individual staff member. Apart from the fundamental knowledge and skills in understanding and managing biodiversity offered in the core courses of this major, strong emphasis is placed upon experiential learning such as overseas field expedition and work placement in the environmental sector. Biodiversity conservation requires scientific input as well as passion. Through the range of formal field-based courses as well as extra-curricular activities offered, students taking this major will have opportunities to participate in research, field conservation and education projects both locally and internationally. Assistance will be provided so that students can develop expertise in one or a few groups of plants or animals, as familiarity with species identification is an essential prerequisite for biodiversity scientists or conservation biologists.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the regional and global environment, and how they interact; identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to understand, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences (Intensive)

Major in Ecology & Biodiversity (Intensive)

Minor in Ecology & Biodiversity

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2306 Ecology and evolution (6) ENVS2002 Environmental data analysis (6)

2. Advanced level courses (42 credits) Disciplinary Core Courses (18 credits)

BIOL3301 Marine biology (6)

BIOL3302 Systematics and phylogenetics (6) BIOL3319 Tropical terrestrial ecology (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3101 Animal behaviour (6) BIOL3303 Conservation biology (6)

BIOL3305 Tropical and temperate marine ecology field course (6)

BIOL3313 Freshwater ecology (6)
BIOL3314 Plant structure and evolution (6)
BIOL3318 Experimental intertidal ecology (6)

BIOL3322	Marine invertebrate zoology (6)
BIOL3328	Nearshore marine and estuarine ecology (6)
BIOL3419	Insect ecology: the little things that run the world (6)
BIOL3506	Evolutionary biology (6)
BIOL4301	Fish and fisheries (6)
BIOL4302	Environmental impact assessment (6)
BIOL4304	Ecosystem functioning and services (6)
BIOL4505	Oyster aquaculture (6)
BIOL4861	Ecology & biodiversity internship (6)
ENVS3019	Urban ecology (6)
ENVS3020	Global change ecology (6)
3. Capstone require	ement (6 credits)
At least 6 credits	selected from the following courses:
BIOL3991	Directed studies in ecology & biodiversity (6)
BIOL4911	Conservation science in practice (6)
BIOL4991	Ecology & biodiversity project (12)

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Ecology & Biodiversity

Offered to students 2016

admitted to Year 1 in

Objectives:

This major is directed at teaching students: (1) how organisms interact with each other and their environments, (2) how species are distributed throughout the world, and (3) key threats and approaches to conserving biodiversity. Special reference is made to Hong Kong and Asia; the ways in which humans have impacted upon natural environments; and, the approaches used to manage or ameliorate those impacts. This major is based around an introductory core, which emphasizes plant and animal biology and includes a compulsory week-long residential field trip. Advanced courses in the major teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial and freshwater environments) with an emphasis on field work, introduces the use of statistical and molecular techniques in ecology, and focuses on certain applied topics such as environmental impact assessment, ecotoxicology, fisheries and mariculture, and biodiversity conservation. Students have an opportunity to conduct independent research in ecology and biodiversity as a final year project or a dissertation under the close supervision of an individual staff member. Apart from the fundamental knowledge and skills in understanding and managing biodiversity offered in the core courses of this major, strong emphasis is placed upon experiential learning such as overseas field expedition and work placement in the environmental sector. Biodiversity conservation requires scientific input as well as passion. Through the range of formal field-based courses as well as extra-curricular activities offered, students taking this major will have opportunities to participate in research, field conservation and education projects both locally and internationally. Assistance will be provided so that students can develop expertise in one or a few groups of plants or animals, as familiarity with species identification is an essential prerequisite for biodiversity scientists or conservation biologists.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the regional and global environment, and how they interact; identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to understand, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity (Intensive)

Required courses (96 credits)

Minor in Ecology & Biodiversity

BIOL3318 BIOL3319

1. Introductory level courses (48 credits) Disciplinary Core Courses: Science Foundation Courses (12 credits) Scientific method and reasoning (6) SCNC1111 SCNC1112 Fundamentals of modern science (6) **Disciplinary Core Courses (36 credits)** From molecules to cells (6) BIOL1110 BIOL1309 Evolutionary diversity (6) BIOL2102 Biostatistics (6) Biological sciences laboratory course (6) BIOL2103 Ecology and evolution (6) **BIOL2306** Environmental data analysis (6) ENVS2002 2. Advanced level courses (42 credits) **Disciplinary Core Courses (12 credits)** BIOL3302 Systematics and phylogenetics (6) **BIOL3303** Conservation biology (6) [previous title: Conservation ecology (6)] **Disciplinary Electives (30 credits)** At least 30 credits selected from the following courses: **BIOI 3101** Animal behaviour (6) Environmental microbiology (6) BIOL3109 Marine biology (6) BIOL3301 Tropical and temperate marine ecology field course (6) **BIOL3305** Freshwater ecology (6) BIOL3313 Plant structure and evolution (6) BIOL3314

[previous title: Terrestrail ecology (6)]

Experimental intertidal ecology (6)

Tropical terrestrial ecology (6)

BIOL3320 BIOL3322 BIOL3328 BIOL3419	The biology of marine mammals (6) Marine invertebrate zoology (6) Nearshore marine and estuarine ecology (6) Insect ecology: the little things that run the world (6)	
BIOL3505	Oyster aquaculture and restoration (6)	Take either BIOL3505 or BIOL4505 to fulfill this 30 credits requirement, but not both. BIOL3505 and BIOL4505 are mutually exclusive.
BIOL3506	Evolutionary biology (6)	
BIOL4301	Fish and fisheries (6)	
BIOL4302	Environmental impact assessment (6)	
BIOL4304	Ecosystem functioning and services (6)	
BIOL4451	Cetacean behaviour, ecology and conservation: field research experience (6)	
BIOL4505	Oyster aquaculture (6)	Take either BIOL3505 or BIOL4505 to fulfill this 30 credits requirement, but not both. BIOL3505 and BIOL4505 are mutually exclusive.
BIOL4861	Ecology & biodiversity internship (6)	
ENVS3019	Urban ecology (6)	
ENVS3020	Global change ecology (6)	
3. Capstone requi	rement (6 credits)	
At least 6 credits	s selected from the following courses:	
BIOL3991	Directed studies in ecology & biodiversity (6)	
BIOL4911	Conservation science in practice (6)	
BIOL4921	Animal behaviour and behavioural ecology: field course (6)	
BIOL4991	Ecology & biodiversity project (12)	

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Ecology & Biodiversity

Offered to students 2015

admitted to Year 1 in

Objectives:

This major is directed at teaching students: (1) how organisms interact with each other and their environments, (2) how species are distributed throughout the world, and (3) key threats and approaches to conserving biodiversity. Special reference is made to Hong Kong and Asia; the ways in which humans have impacted upon natural environments; and, the approaches used to manage or ameliorate those impacts. This major is based around an introductory core, which emphasizes plant and animal biology and includes a compulsory week-long residential field trip. Advanced courses in the major teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial and freshwater environments) with an emphasis on field work, introduces the use of statistical and molecular techniques in ecology, and focuses on certain applied topics such as environmental impact assessment, ecotoxicology, fisheries and mariculture, and biodiversity conservation. Students have an opportunity to conduct independent research in ecology and biodiversity as a final year project or a dissertation under the close supervision of an individual staff member. Apart from the fundamental knowledge and skills in understanding and managing biodiversity offered in the core courses of this major, strong emphasis is placed upon experiential learning such as overseas field expedition and work placement in the environmental sector. Biodiversity conservation requires scientific input as well as passion. Through the range of formal field-based courses as well as extra-curricular activities offered, students taking this major will have opportunities to participate in research, field conservation and education projects both locally and internationally. Assistance will be provided so that students can develop expertise in one or a few groups of plants or animals, as familiarity with species identification is an essential prerequisite for biodiversity scientists or conservation biologists.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the regional and global environment, and how they interact; identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to understand, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity (Intensive)

Minor in Ecology & Biodiversity

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

Scientific method and reasoning (6) SCNC1111 SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

From molecules to cells (6) BIOL1110 BIOL1309 Evolutionary diversity (6) BIOL2102 Biostatistics (6)

Biological sciences laboratory course (6) BIOL2103

Ecology and evolution (6) BIOL2306 Environmental data analysis (6) ENVS2002

2. Advanced level courses (42 credits) **Disciplinary Core Courses (12 credits)**

BIOL3302 Systematics and phylogenetics (6)

BIOL3303 Conservation biology (6)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

BIOL3101 Animal behaviour (6) Take either BIOL3101 or BIOL4303 to fulfill this 30 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually

BIOL3109 Environmental microbiology (6)

BIOL3301 Marine biology (6)

BIOL3305 Tropical and temperate marine ecology field course (6)

Freshwater ecology (6) BIOL3313

exclusive

[previous title: Conservation ecology (6)]

BIOL3314 BIOL3318 BIOL3319 BIOL3320 BIOL3322 BIOL3328 BIOL3419	Plant structure and evolution (6) Experimental intertidal ecology (6) Tropical terrestrial ecology (6) The biology of marine mammals (6) Marine invertebrate zoology (6) Nearshore marine and estuarine ecology (6) Insect ecology: the little things that run the world (6)	[previous title: Terrestrail ecology (6)]
BIOL3505	Oyster aquaculture and restoration (6)	Take either BIOL3505 or BIOL4505 to fulfill this 30 credits requirement, but not both. BIOL3505 and BIOL4505 are mutually exclusive.
BIOL3506	Evolutionary biology (6)	0.0.00.00
BIOL4301	Fish and fisheries (6)	
BIOL4302	Environmental impact assessment (6)	
BIOL4303	Animal behaviour (6)	Take either BIOL3101 or BIOL4303 to fulfill this 30 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually exclusive.
BIOL4304	Ecosystem functioning and services (6)	
BIOL4451	Cetacean behaviour, ecology and conservation: field research experience (6)	1
BIOL4505	Oyster aquaculture (6)	Take either BIOL3505 or BIOL4505 to fulfill this 30 credits requirement, but not both. BIOL3505 and BIOL4505 are mutually exclusive.
BIOL4861	Ecology & biodiversity internship (6)	
ENVS3019	Urban ecology (6)	
ENVS3020	Global change ecology (6)	
3. Capstone require	G G, ()	
	selected from the following courses:	
BIOL3951	Ecology & biodiversity field course (6)	Take either BIOL3951 (subclass B) or BIOL4921 to fulfill this 6 credits requirement, but not both. BIOL3951 (subclass B) and BIOL4921 are mutually exclusive.
BIOL3991	Directed studies in ecology & biodiversity (6)	BIOL+02 I are matadily exclusive.
BIOL4911	Conservation science in practice (6)	
BIOL4921	Animal behaviour and behavioural ecology: field course (6)	Take either BIOL3951 (subclass B) or BIOL4921 to fulfill this 6 credits requirement, but not both. BIOL3951 (subclass B) and BIOL4921 are mutually exclusive.
BIOL4991	Ecology & biodiversity project (12)	

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Ecology & Biodiversity

2014

Offered to students

admitted to Year 1 in

Objectives:

This major is directed at teaching students: (1) how organisms interact with each other and their environments, (2) how species are distributed throughout the world, and (3) key threats and approaches to conserving biodiversity. Special reference is made to Hong Kong and Asia; the ways in which humans have impacted upon natural environments; and, the approaches used to manage or ameliorate those impacts. This major is based around an introductory core, which emphasizes plant and animal biology and includes a compulsory week-long residential field trip. Advanced courses in the major teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial and freshwater environments) with an emphasis on field work, introduces the use of statistical and molecular techniques in ecology, and focuses on certain applied topics such as environmental impact assessment, ecotoxicology, fisheries and mariculture, and biodiversity conservation. Students have an opportunity to conduct independent research in ecology and biodiversity as a final year project or a dissertation under the close supervision of an individual staff member. Apart from the fundamental knowledge and skills in understanding and managing biodiversity offered in the core courses of this major, strong emphasis is placed upon experiential learning such as overseas field expedition and work placement in the environmental sector. Biodiversity conservation requires scientific input as well as passion. Through the range of formal field-based courses as well as extra-curricular activities offered, students taking this major will have opportunities to participate in research, field conservation and education projects both locally and internationally. Assistance will be provided so that students can develop expertise in one or a few groups of plants or animals, as familiarity with species identification is an essential prerequisite for biodiversity scientists or conservation biologists.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the regional and global environment, and how they interact; identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to understand, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Required courses (96 credits)

Minor in Ecology & Biodiversity

Introductory level courses (48 credits) Disciplinary Core Courses: Science Foundation Courses (12 cred			
ı	SCNC1111	Scientific method and reasoning (6)	
ı	SCNC1112	Fundamentals of modern science (6)	
1	Disciplinary Coro Courses (36 credits)		

Disciplinary Core Courses (36 credits) From molecules to cells (6) BIOL1110 Evolutionary diversity (6) BIOL1309

BIOL2102 Biostatistics (6)

Biological sciences laboratory course (6) BIOI 2103

Ecology and evolution (6) BIOL2306 Environmental data analysis (6) ENVS2002

2. Advanced level courses (42 credits) **Disciplinary Core Courses (12 credits)**

BIOL3302 Systematics and phylogenetics (6)

Conservation biology (6) BIOL3303

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

BIOL3101 Animal behaviour (6)

Take either BIOI 3101 or BIOI 4303 to fulfill this 30 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually exclusive.

[previous title: Conservation ecology (6)]

BIOL3109 Environmental microbiology (6)

BIOL3301 Marine biology (6)

Tropical and temperate marine ecology field course (6) BIOL3305

BIOL3313 Freshwater ecology (6) Plant structure and evolution (6) **BIOL3314**

BIOL3318 BIOL3319 BIOL3320 BIOL3322 BIOL3328 BIOL3419	Experimental intertidal ecology (6) Tropical terrestrial ecology (6) The biology of marine mammals (6) Marine invertebrate zoology (6) Nearshore marine and estuarine ecology (6) Insect ecology: the little things that run the world (6)	[previous title: Terrestrial ecology (6)]
BIOL3505	Oyster aquaculture and restoration (6)	Take either BIOL3505 or BIOL4505 to fulfill this 30 credits requirement, but not both. BIOL3505 and BIOL4505 are mutually exclusive.
BIOL4301	Fish and fisheries (6)	
BIOL4302	Environmental impact assessment (6)	
BIOL4303	Animal behaviour (6)	Take either BIOL3101 or BIOL4303 to fulfill this 30 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually exclusive.
BIOL4304	Ecosystem functioning and services (6)	
BIOL4451	Cetacean behaviour, ecology and conservation: field research experience (6)	
BIOL4505	Oyster aquaculture (6)	Take either BIOL3505 or BIOL4505 to fulfill this 30 credits requirement, but not both. BIOL3505 and BIOL4505 are mutually exclusive.
BIOL4861	Ecology & biodiversity internship (6)	5.0.00.00
ENVS3019	Urban ecology (6)	
ENVS3020	Global change ecology (6)	
3. Capstone requir	rement (6 credits)	
	selected from the following courses:	
BIOL3951	Ecology & biodiversity field course (6)	Take either BIOL3951 (subclass B) or BIOL4921 to fulfill this 6 credits requirement, but not both. BIOL3951 (subclass B) and BIOL4921 are mutually exclusive.
BIOL3991	Directed studies in ecology & biodiversity (6)	a.oa.a.ny ono.ao.ro.
BIOL4911	Conservation science in practice (6)	
BIOL4921	Animal behaviour and behavioural ecology: field course (6)	Take either BIOL3951 (subclass B) or BIOL4921 to fulfill this 6 credits requirement, but not both. BIOL3951 (subclass B) and BIOL4921 are mutually exclusive.
BIOL4991	Ecology & biodiversity project (12)	•

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Ecology & Biodiversity

Offered to students 2013

admitted to Year 1 in

Objectives:

This major is directed at teaching students: (1) how organisms interact with each other and their environments, (2) how species are distributed throughout the world, and (3) key threats and approaches to conserving biodiversity. Special reference is made to Hong Kong and Asia; the ways in which humans have impacted upon natural environments; and, the approaches used to manage or ameliorate those impacts. This major is based around an introductory core, which emphasizes plant and animal biology and includes a compulsory week-long residential field trip. Advanced courses in the major teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial and freshwater environments) with an emphasis on field work, introduces the use of statistical and molecular techniques in ecology, and focuses on certain applied topics such as environmental impact assessment, ecotoxicology, fisheries and mariculture, and biodiversity conservation. Students have an opportunity to conduct independent research in ecology and biodiversity as a final year project or a dissertation under the close supervision of an individual staff member. Apart from the fundamental knowledge and skills in understanding and managing biodiversity offered in the core courses of this major, strong emphasis is placed upon experiential learning such as overseas field expedition and work placement in the environmental sector. Biodiversity conservation requires scientific input as well as passion. Through the range of formal field-based courses as well as extra-curricular activities offered, students taking this major will have opportunities to participate in research, field conservation and education projects both locally and internationally. Assistance will be provided so that students can develop expertise in one or a few groups of plants or animals, as familiarity with species identification is an essential prerequisite for biodiversity scientists or conservation biologists.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the regional and global environment, and how they interact; identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to understand, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Minor in Ecology & Biodiversity

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2102 Biostatistics (6)
BIOL2103 Biological sciences laboratory course (6)

BIOL2306 Ecology and evolution (6)
ENVS2002 Environmental data analysis (6)

2. Advanced level courses (42 credits) Disciplinary Core Courses (12 credits)

BIOL3302 Systematics and phylogenetics (6)

BIOL3303 Conservation biology (6)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

BIOL3101 Animal behaviour (6)

Take either BIOL3101 or BIOL4303 to fulfill this 30 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually exclusive.

[previous title: Conservation ecology (6)]

BIOL3109 Environmental microbiology (6)

BIOL3301 Marine biology (6)

BIOL3305 Tropical and temperate marine ecology field course (6)

BIOL3313 Freshwater ecology (6)
BIOL3314 Plant structure and evolution (6)

BIOL3318 BIOL3319 BIOL3320 BIOL3322 BIOL3328 BIOL3419	Experimental intertidal ecology (6) Tropical terrestrial ecology (6) The biology of marine mammals (6) Marine invertebrate zoology (6) Nearshore marine and estuarine ecology (6) Insect ecology: the little things that run the world (6)	[previous title: Terrestrail ecology (6)]
BIOL3505	Oyster aquaculture and restoration (6)	Take either BIOL3505 or BIOL4505 to fulfill this 30 credits requirement, but not both. BIOL3505 and BIOL4505 are mutually exclusive.
BIOL4301	Fish and fisheries (6)	
BIOL4302	Environmental impact assessment (6)	
BIOL4303	Animal behaviour (6)	Take either BIOL3101 or BIOL4303 to fulfill this 30 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually exclusive.
BIOL4304	Ecosystem functioning and services (6)	
BIOL4451	Cetacean behaviour, ecology and conservation: field research experience (6)	
BIOL4505	Oyster aquaculture (6)	Take either BIOL3505 or BIOL4505 to fulfill this 30 credits requirement, but not both. BIOL3505 and BIOL4505 are mutually exclusive.
BIOL4861	Ecology & biodiversity internship (6)	
ENVS3019	Urban ecology (6)	
ENVS3020	Global change ecology (6)	
3. Capstone require	ment (6 credits)	
At least 6 credits s	selected from the following courses:	
BIOL3951	Ecology & biodiversity field course (6)	Take either BIOL3951 (subclass B) or BIOL4921 to fulfill this 6 credits requirement, but not both. BIOL3951 (subclass B) and BIOL4921 are mutually exclusive.
BIOL3991	Directed studies in ecology & biodiversity (6)	•
BIOL4911	Conservation science in practice (6)	
BIOL4921	Animal behaviour and behavioural ecology: field course (6)	Take either BIOL3951 (subclass B) or BIOL4921 to fulfill this 6 credits requirement, but not both. BIOL3951 (subclass B) and BIOL4921 are mutually exclusive.
BIOL4991	Ecology & biodiversity project (12)	,

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Ecology & Biodiversity

Offered to students 2012

admitted to Year 1 in

Objectives:

This major is directed at teaching students: (1) how organisms interact with each other and their environments, (2) how species are distributed throughout the world, and (3) key threats and approaches to conserving biodiversity. Special reference is made to Hong Kong and Asia; the ways in which humans have impacted upon natural environments; and, the approaches used to manage or ameliorate those impacts. This major is based around an introductory core, which emphasizes plant and animal biology and includes a compulsory week-long residential field trip. Advanced courses in the major teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial and freshwater environments) with an emphasis on field work, introduces the use of statistical and molecular techniques in ecology, and focuses on certain applied topics such as environmental impact assessment, ecotoxicology, fisheries and mariculture, and biodiversity conservation. Students have an opportunity to conduct independent research in ecology and biodiversity as a final year project or a dissertation under the close supervision of an individual staff member. Apart from the fundamental knowledge and skills in understanding and managing biodiversity offered in the core courses of this major, strong emphasis is placed upon experiential learning such as overseas field expedition and work placement in the environmental sector. Biodiversity conservation requires scientific input as well as passion. Through the range of formal field-based courses as well as extra-curricular activities offered, students taking this major will have opportunities to participate in research, field conservation and education projects both locally and internationally. Assistance will be provided so that students can develop expertise in one or a few groups of plants or animals, as familiarity with species identification is an essential prerequisite for biodiversity scientists or conservation biologists.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the regional and global environment, and how they interact; identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to understand, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

	Minor in Ecology & Biodiversity				
	Required courses (96 credits)				
	1. Introductory level courses (42 credits)				
		ourses: Science Foundation Courses (12 credits)			
	SCNC1111	Scientific method and reasoning (6)			
	SCNC1112	()			
	Disciplinary Core C	ourses (30 credits)			
	BIOL1110	From molecules to cells (6)			
	BIOL1309	Evolutionary diversity (6)			
	BIOL2102	Biostatistics (6)			
	BIOL2103	Biological sciences laboratory course (6)			
	BIOL2306	Ecology and evolution (6)			
	2. Advanced level c				
	Disciplinary Core C				
	BIOL3302	Systematics and phylogenetics (6)			
	BIOL3303	Conservation biology (6)	[previous title: Conservation ecology (6)]		
Disciplinary Electives (36 credits)					
	At least 36 credits	selected from the following courses:			
	BIOL3101	Animal behaviour (6)	Take either BIOL3101 or BIOL4303 to fulfill this 36 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually exclusive.		
	BIOL3109	Environmental microbiology (6)			
	BIOL3301	Marine biology (6)			
	BIOL3305	Tropical and temperate marine ecology field course (6)			
	BIOL3313	Freshwater ecology (6)			
	BIOL3314	Plant structure and evolution (6)			
	BIOL3318	Experimental intertidal ecology (6)			
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BIOL3319 BIOL3320 BIOL3322 BIOL3328 BIOL3419	Tropical terrestrial ecology (6) The biology of marine mammals (6) Marine invertebrate zoology (6) Nearshore marine and estuarine ecology (6) Insect ecology: the little things that run the world (6)	[previous title: Terrestrial ecology (6)]
BIOL3505	Oyster aquaculture and restoration (6)	Take either BIOL3505 or BIOL4505 to fulfill this 36 credits requirement, but not both. BIOL3505 and BIOL4505 are mutually exclusive.
BIOL4301	Fish and fisheries (6)	
BIOL4302	Environmental impact assessment (6)	
BIOL4303	Animal behaviour (6)	Take either BIOL3101 or BIOL4303 to fulfill this 36 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually exclusive.
BIOL4304	Ecosystem functioning and services (6)	
BIOL4451	Cetacean behaviour, ecology and conservation: field research experience (6)	
BIOL4505	Oyster aquaculture (6)	Take either BIOL3505 or BIOL4505 to fulfill this 36 credits requirement, but not both. BIOL3505 and BIOL4505 are mutually exclusive.
BIOL4861	Ecology & biodiversity internship (6)	
ENVS3019	Urban ecology (6)	
ENVS3020	Global change ecology (6)	
3. Capstone require	ement (6 credits)	
At least 6 credits	selected from the following courses:	
BIOL3951	Ecology & biodiversity field course (6)	Take either BIOL3951 (subclass B) or BIOL4921 to fulfill this 6 credits requirement, but not both. BIOL3951 (subclass B) and BIOL4921 are mutually exclusive.
BIOL3991	Directed studies in ecology & biodiversity (6)	, , , , , , , , , , , , , , , , , , , ,
BIOL4911	Conservation science in practice (6)	
BIOL4921	Animal behaviour and behavioural ecology: field course (6)	Take either BIOL3951 (subclass B) or BIOL4921 to fulfill this 6 credits requirement, but not both. BIOL3951 (subclass B) and BIOL4921 are mutually exclusive.
BIOL4991	Ecology & biodiversity project (12)	•

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Ecology & Biodiversity (Intensive)

2020

Offered to students

admitted to Year 1 in

Objectives:

This intensive major is directed at teaching students the 'rules of existence' for organisms in natural and human-modified environments, including major threats to biodiversity and the approaches adopted to conserve species and habitats. Special reference is made to the plants, animals and habitats of Hong Kong and Asia, the ways in which humans have altered the region's ecosystems, and the management or mitigation of those impacts. The range and scope of courses offered will provide students with a firm foundation in ecology, biodiversity and related disciplines, and equip them with the skills required for postgraduate research or employment with government and non-government organizations concerned with biodiversity conservation, nature preservation or habitat assessment and management.

The intensive major is based around an introductory core that emphasizes biology, ecology and evolution of plants and animals; it includes a compulsory residential field trip (as part of the Ecology and Evolution course), as well as instruction in data analysis and biostatistics. Many of the advanced courses in the major have a strong emphasis on field-work and on small projects performed by students. They teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial, freshwater and urban) and taxa (e.g. flowering plants, insects, fishes, marine mammals). Other courses focus on more applied topics, such as environmental impact assessment, conservation, and provide an opportunity for students to become familiar with specialised topics ranging from systematics to animal behaviour.

During their final year, students have an opportunity to conduct independent research in the form of an ecology and biodiversity research project or a directed-studies dissertation under the close supervision of an individual staff member. Students are able to make use of the facilities of the Swire Institute of Marine Science for such work. Strong emphasis is also placed upon experiential learning during overseas field trips that can be taken as part of the capstone requirement of this intensive major.

Ecology and biodiversity research requires extensive scientific knowledge as well as passion, and students are encouraged to take more than the requisite 12-credit minimum of capstone courses. Through these courses, and the range of formal field-based options as well as various extra-curricular activities offered, students will be expected to develop expertise in one or a few groups of plants or animals; this is an important skill since an ability to identify species and major taxa is an essential prerequisite for biodiversity scientists or conservation biologists.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the local, regional and global environment, and how they interact; evaluate their role in ecosystem functioning and identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: assess, understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to assess, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research in top-level Universities around the world or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems in a changing world. (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

Major in Biological Sciences (Intensive)

Major in Ecology & Biodiversity

Minor in Ecology & Biodiversity

Required courses (144 credits)

1. Introductory level courses (60 credits) Disciplinary Core Courses: Science Foundation Courses (12 credits)

Disciplinary Core Courses (42 credits)				
SCNC1112	Fundamentals of modern science (6)		(Note 1)	
SCNC1111	Scientific method and reasoning (6)	•	(Note 1)	

BIOL1110 From molecules to cells (6) (Note 1)
BIOL1309 Evolutionary diversity (6) (Note 1)
BIOL2102 Biostatistics (6) (Note 1)
BIOL2103 Biological sciences laboratory course (6) (Note 1)

fulfill this 6 credits requirement, but not both.

BIOL2306 Ecology and evolution (6) (Note 1)

EASC1401 Blue Planet (6)

Environmental data analysis (6) (Note 1) ENVS2002

Disciplinary Electives (6 credits)

Plus at least 6 credits selected from the following courses:

CHEM1041 Foundations of chemistry (6) Take either CHEM1041 or CHEM1042 to fulfill this 6 credits requirement, but not both. CHEM1042 General chemistry I (6) Take either CHEM1041 or CHEM1042 to

2. Advanced level courses (66 to 72 credits) (Note 2)

Disciplinary Core Courses (30 credits) Animal behaviour (6) BIOL3101

BIOL3301 Marine biology (6) (Note 1) BIOL3302 Systematics and phylogenetics (6) (Note 1) BIOL3303 Conservation biology (6) BIOL3319 Tropical terrestrial ecology (6) (Note 1)

Disciplinary Electives (36 to 42 credits) (Note 2)

Plus at least 36 or 42 credits selected from the following courses:

Tropical and temperate marine ecology field course (6) **BIOL3305 BIOL3313** Freshwater ecology (6)

BIOL3314 Plant structure and evolution (6) Experimental intertidal ecology (6) **BIOL3318 BIOL3322** Marine invertebrate zoology (6)

Nearshore marine and estuarine ecology (6) **BIOI 3328**

BIOL3408 Genetics (6)

Insect ecology: the little things that run the world (6) BIOL3419

BIOL3506 Evolutionary biology (6) BIOL4301 Fish and fisheries (6)

BIOL4302 Environmental impact assessment (6) Ecosystem functioning and services (6) BIOL4304

BIOL4505 Oyster aquaculture (6) Urban ecology (6) ENVS3019 ENVS3020 Global change ecology (6)

3. Capstone requirement (12 to 18 credits) (Note 2)

Disciplinary Core Courses (12 credits)

BIOI 4991 Ecology & biodiversity project (12)

Disciplinary Electives (6 credits)

BIOL3991 Directed studies in ecology & biodiversity (6) BIOL4911 Conservation science in practice (6)

Notes:

1. These are core courses in the regular Ecology & Biodiversity Major (96 credits) curriculum.

2. Within the E&B accredited curriculum, students have to pass a total of 60 credits within the Introductory Level Courses spread across two Science Foundation Courses (Level 1; 12 credits), seven Disciplinary Core Courses (Levels 1 & 2; 42 credits) and one chemistry (Level 1; 6 credits). For the chemistry course, students will have the choice between CHEM1041 and CHEM1042 in function of their prior chemistry background acquired during their upper secondary education. Students with no chemistry background should follow CHEM1041, while students with previous chemistry background should take CHEM1042.

Advanced Level Courses cover a total of 66 to 72 credits. Those are divided between five Disciplinary Core Courses (Level 3; 30 credits) and 6 to 7 Disciplinary Elective Courses (Level 3 & 4; 36 to 42 credits) among a choice of fourteen different courses. As eight of the Disciplinary Elective courses are being taught every other year, students must pay attention to the year during which these courses are taught and ensure that they have fulfilled the necessary requirements. There is a student mentorship programme in place that can assist them in this

During their final year, students should complete a minimum of 12 credits as Capstone Courses (maximum of 18). The Ecology & Biodiversity Project (12 credits) is mandatory and students can choose to complete one of the other two Elective Capstone Courses (6 credits). If students choose to complete 18 credits of Capstone Courses, then they are required to complete only 36 credits of Disciplinary Elective Courses within the Advanced Level Courses (instead of 42 credits)

Finally, students who participate in student exchange programme are expected to enquire, prior to their departure from HKU, about potential equivalences with the courses taken during exchange programmes to ensure that they match requirements for obtaining the RSB accredited

- 3. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Major Title Major in Ecology & Biodiversity (Intensive)

2019

Offered to students

admitted to Year 1 in

Objectives:

This intensive major is directed at teaching students the 'rules of existence' for organisms in natural and human-modified environments, including major threats to biodiversity and the approaches adopted to conserve species and habitats. Special reference is made to the plants, animals and habitats of Hong Kong and Asia, the ways in which humans have altered the region's ecosystems, and the management or mitigation of those impacts. The range and scope of courses offered will provide students with a firm foundation in ecology, biodiversity and related disciplines, and equip them with the skills required for postgraduate research or employment with government and non-government organizations concerned with biodiversity conservation, nature preservation or habitat assessment and management.

The intensive major is based around an introductory core that emphasizes biology, ecology and evolution of plants and animals; it includes a compulsory residential field trip (as part of the Ecology and Evolution course), as well as instruction in data analysis and biostatistics. Many of the advanced courses in the major have a strong emphasis on field-work and on small projects performed by students. They teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial, freshwater and urban) and taxa (e.g. flowering plants, insects, fishes, marine mammals). Other courses focus on more applied topics, such as environmental impact assessment, conservation, and provide an opportunity for students to become familiar with specialised topics ranging from systematics to animal behaviour.

During their final year, students have an opportunity to conduct independent research in the form of an ecology and biodiversity research project or a directed-studies dissertation under the close supervision of an individual staff member. Students are able to make use of the facilities of the Swire Institute of Marine Science for such work. Strong emphasis is also placed upon experiential learning during overseas field trips that can be taken as part of the capstone requirement of this intensive major.

Ecology and biodiversity research requires extensive scientific knowledge as well as passion, and students are encouraged to take more than the requisite 12-credit minimum of capstone courses. Through these courses, and the range of formal field-based options as well as various extra-curricular activities offered, students will be expected to develop expertise in one or a few groups of plants or animals; this is an important skill since an ability to identify species and major taxa is an essential prerequisite for biodiversity scientists or conservation biologists.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the local, regional and global environment, and how they interact; evaluate their role in ecosystem functioning and identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: assess, understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to assess, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research in top-level Universities around the world or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems in a changing world. (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

Major in Biological Sciences (Intensive)

Major in Ecology & Biodiversity

Minor in Ecology & Biodiversity

Required courses (144 credits)

1. Introductory level courses (60 credits) Disciplinary Core Courses: Science Foundation Courses (12 credits)

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SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core Courses (42 credits)		
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BIOL1110 From molecules to cells (6) (Note 1)
BIOL1309 Evolutionary diversity (6) (Note 1)
BIOL2102 Biostatistics (6) (Note 1)
BIOL2103 Biological sciences laboratory course (6) (Note 1)

BIOL2306 Ecology and evolution (6) (Note 1)

EASC1401 Blue Planet (6)

ENVS2002 Environmental data analysis (6) (Note 1)

Disciplinary Electives (6 credits)

Plus at least 6 credits selected from the following courses:

CHEM1041 Foundations of chemistry (6) Take either CHEM1041 or CHEM1042 to fulfill this 6 credits requirement, but not both.

CHEM1042 General chemistry I (6) Take either CHEM1041 or CHEM1042 to fulfill this 6 credits requirement, but not both.

2. Advanced level courses (66 to 72 credits) (Note 2)

Disciplinary Core Courses (30 credits)

BIOL3101 Animal behaviour (6)

BIOL3301 Marine biology (6) (Note 1)

BIOL3302 Systematics and phylogenetics (6) (Note 1)

BIOL3303 Conservation biology (6)

BIOL3319 Tropical terrestrial ecology (6) (Note 1)

Disciplinary Electives (36 to 42 credits) (Note 2)

Plus at least 36 or 42 credits selected from the following courses:

BIOL3305 Tropical and temperate marine ecology field course (6)
BIOL3313 Freshwater ecology (6)
BIOL3314 Plant structure and evolution (6)

BIOL3314 Plant structure and evolution (6)
BIOL3318 Experimental intertidal ecology (6)
BIOL3322 Marine invertebrate zoology (6)

BIOL3328 Nearshore marine and estuarine ecology (6)

BIOL3408 Genetics (6)

BIOL3419 Insect ecology: the little things that run the world (6)

BIOL3506 Evolutionary biology (6) BIOL4301 Fish and fisheries (6)

BIOL4302 Environmental impact assessment (6)
BIOL4304 Ecosystem functioning and services (6)

BIOL4505 Oyster aquaculture (6)
ENVS3019 Urban ecology (6)
ENVS3020 Global change ecology (6)

3. Capstone requirement (12 to 18 credits) (Note 2)

Disciplinary Core Courses (12 credits)

BIOL4991 Ecology & biodiversity project (12)

Disciplinary Electives (6 credits)

BIOL3991 Directed studies in ecology & biodiversity (6)
BIOL4911 Conservation science in practice (6)

Notes:

1. These are core courses in the regular Ecology & Biodiversity Major (96 credits) curriculum.

2. Within the E&B accredited curriculum, students have to pass a total of 60 credits within the Introductory Level Courses spread across two Science Foundation Courses (Level 1; 12 credits), seven Disciplinary Core Courses (Levels 1 & 2; 42 credits) and one chemistry (Level 1; 6 credits). For the chemistry course, students will have the choice between CHEM1041 and CHEM1042 in function of their prior chemistry background acquired during their upper secondary education. Students with no chemistry background should follow CHEM1041, while students with previous chemistry background should take CHEM1042.

Advanced Level Courses cover a total of 66 to 72 credits. Those are divided between five Disciplinary Core Courses (Level 3; 30 credits) and 6 to 7 Disciplinary Elective Courses (Level 3 & 4; 36 to 42 credits) among a choice of fourteen different courses. As eight of the Disciplinary Elective courses are being taught every other year, students must pay attention to the year during which these courses are taught and ensure that they have fulfilled the necessary requirements. There is a student mentorship programme in place that can assist them in this.

During their final year, students should complete a minimum of 12 credits as Capstone Courses (maximum of 18). The Ecology & Biodiversity Project (12 credits) is mandatory and students can choose to complete one of the other two Elective Capstone Courses (6 credits). If students choose to complete 18 credits of Capstone Courses, then they are required to complete only 36 credits of Disciplinary Elective Courses within the Advanced Level Courses (instead of 42 credits)

Finally, students who participate in student exchange programme are expected to enquire, prior to their departure from HKU, about potential equivalences with the courses taken during exchange programmes to ensure that they match requirements for obtaining the RSB accredited programme.

Remarks:

Major Title Major in Ecology & Biodiversity (Intensive)

2018

Offered to students

admitted to Year 1 in

Objectives:

This intensive major is directed at teaching students the 'rules of existence' for organisms in natural and human-modified environments, including major threats to biodiversity and the approaches adopted to conserve species and habitats. Special reference is made to the plants, animals and habitats of Hong Kong and Asia, the ways in which humans have altered the region's ecosystems, and the management or mitigation of those impacts. The range and scope of courses offered will provide students with a firm foundation in ecology, biodiversity and related disciplines, and equip them with the skills required for postgraduate research or employment with government and non-government organizations concerned with biodiversity conservation, nature preservation or habitat assessment and management.

The intensive major is based around an introductory core that emphasizes biology, ecology and evolution of plants and animals; it includes a compulsory residential field trip (as part of the Ecology and Evolution course), as well as instruction in data analysis and biostatistics. Many of the advanced courses in the major have a strong emphasis on field-work and on small projects performed by students. They teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial, freshwater and urban) and taxa (e.g. flowering plants, insects, fishes, marine mammals). Other courses focus on more applied topics, such as environmental impact assessment, conservation, and provide an opportunity for students to become familiar with specialised topics ranging from systematics to animal behaviour.

During their final year, students have an opportunity to conduct independent research in the form of an ecology and biodiversity research project or a directed-studies dissertation under the close supervision of an individual staff member. Students are able to make use of the facilities of the Swire Institute of Marine Science for such work. Strong emphasis is also placed upon experiential learning during overseas field trips that can be taken as part of the capstone requirement of this intensive major.

Ecology and biodiversity research requires extensive scientific knowledge as well as passion, and students are encouraged to take more than the requisite 12-credit minimum of capstone courses. Through these courses, and the range of formal field-based options as well as various extra-curricular activities offered, students will be expected to develop expertise in one or a few groups of plants or animals; this is an important skill since an ability to identify species and major taxa is an essential prerequisite for biodiversity scientists or conservation biologists.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the local, regional and global environment, and how they interact; evaluate their role in ecosystem functioning and identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: assess, understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to assess, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research in top-level Universities around the world or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems in a changing world. (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

Major in Biological Sciences (Intensive)

Major in Ecology & Biodiversity

Minor in Ecology & Biodiversity

Required courses (144 credits)

1. Introductory level courses (60 credits) Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core	Courses (42 credits)	
BIOI 1110	From molecules to cells (6)	(Note 1)

BIOL1110 From molecules to cells (6) (Note 1)
BIOL1309 Evolutionary diversity (6) (Note 1)
BIOL2102 Biostatistics (6) (Note 1)
BIOL2103 Biological sciences laboratory course (6) (Note 1)

fulfill this 6 credits requirement, but not both.

(Note 1)

BIOL2306 Ecology and evolution (6) (Note 1)

EASC1401 Blue Planet (6)

Environmental data analysis (6) (Note 1) ENVS2002

Disciplinary Electives (6 credits)

BIOL3319

Plus at least 6 credits selected from the following courses:

CHEM1041 Foundations of chemistry (6) Take either CHEM1041 or CHEM1042 to fulfill this 6 credits requirement, but not both. CHEM1042 General chemistry I (6) Take either CHEM1041 or CHEM1042 to

2. Advanced level courses (66 to 72 credits) (Note 2)

Disciplinary Core Courses (30 credits) Animal behaviour (6) BIOL3101 BIOL3301 Marine biology (6) (Note 1) BIOL3302 Systematics and phylogenetics (6) (Note 1) BIOL3303 Conservation biology (6)

Disciplinary Electives (36 to 42 credits) (Note 2)

Plus at least 36 or 42 credits selected from the following courses:

Tropical and temperate marine ecology field course (6) **BIOL3305 BIOL3313** Freshwater ecology (6)

Tropical terrestrial ecology (6)

BIOL3314 Plant structure and evolution (6) Experimental intertidal ecology (6) **BIOL3318 BIOL3322** Marine invertebrate zoology (6)

BIOL3328 Nearshore marine and estuarine ecology (6)

BIOL3408 Genetics (6)

Insect ecology: the little things that run the world (6) BIOL3419

BIOL3506 Evolutionary biology (6) BIOL4301 Fish and fisheries (6)

BIOL4302 Environmental impact assessment (6) Ecosystem functioning and services (6) BIOL4304

BIOL4505 Oyster aquaculture (6) Urban ecology (6) ENVS3019 ENVS3020 Global change ecology (6)

3. Capstone requirement (12 to 18 credits) (Note 2)

Disciplinary Core Courses (12 credits)

BIOI 4991 Ecology & biodiversity project (12)

Disciplinary Electives (6 credits)

BIOL3991 Directed studies in ecology & biodiversity (6) BIOL4911 Conservation science in practice (6)

Notes:

1. These are core courses in the regular Ecology & Biodiversity Major (96 credits) curriculum.

2. Within the E&B accredited curriculum, students have to pass a total of 60 credits within the Introductory Level Courses spread across two Science Foundation Courses (Level 1; 12 credits), seven Disciplinary Core Courses (Levels 1 & 2; 42 credits) and one chemistry (Level 1; 6 credits). For the chemistry course, students will have the choice between CHEM1041 and CHEM1042 in function of their prior chemistry background acquired during their upper secondary education. Students with no chemistry background should follow CHEM1041, while students with previous chemistry background should take CHEM1042.

Advanced Level Courses cover a total of 66 to 72 credits. Those are divided between five Disciplinary Core Courses (Level 3; 30 credits) and 6 to 7 Disciplinary Elective Courses (Level 3 & 4; 36 to 42 credits) among a choice of fourteen different courses. As eight of the Disciplinary Elective courses are being taught every other year, students must pay attention to the year during which these courses are taught and ensure that they have fulfilled the necessary requirements. There is a student mentorship programme in place that can assist them in this

During their final year, students should complete a minimum of 12 credits as Capstone Courses (maximum of 18). The Ecology & Biodiversity Project (12 credits) is mandatory and students can choose to complete one of the other two Elective Capstone Courses (6 credits). If students choose to complete 18 credits of Capstone Courses, then they are required to complete only 36 credits of Disciplinary Elective Courses within the Advanced Level Courses (instead of 42 credits)

Finally, students who participate in student exchange programme are expected to enquire, prior to their departure from HKU, about potential equivalences with the courses taken during exchange programmes to ensure that they match requirements for obtaining the RSB accredited programme.

Remarks:

Major Title Major in Ecology & Biodiversity (Intensive)

Offered to students

2017

admitted to Year 1 in

Objectives:

This intensive major is directed at teaching students the 'rules of existence' for organisms in natural and human-modified environments, including major threats to biodiversity and the approaches adopted to conserve species and habitats. Special reference is made to the plants, animals and habitats of Hong Kong and Asia, the ways in which humans have altered the region's ecosystems, and the management or mitigation of those impacts. The range and scope of courses offered will provide students with a firm foundation in ecology, biodiversity and related disciplines, and equip them with the skills required for postgraduate research or employment with government and non-government organizations concerned with biodiversity conservation, nature preservation or habitat assessment and management.

The intensive major is based around an introductory core that emphasizes biology, ecology and evolution of plants and animals; it includes a compulsory residential field trip (as part of the Ecology and Evolution course), as well as instruction in data analysis and biostatistics. Many of the advanced courses in the major have a strong emphasis on field-work and on small projects performed by students. They teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial, freshwater and urban) and taxa (e.g. flowering plants, insects, fishes, marine mammals). Other courses focus on more applied topics, such as environmental impact assessment, conservation, and provide an opportunity for students to become familiar with specialised topics ranging from systematics to animal behaviour.

During their final year, students have an opportunity to conduct independent research in the form of an ecology and biodiversity research project or a directed-studies dissertation under the close supervision of an individual staff member. Students are able to make use of the facilities of the Swire Institute of Marine Science for such work. Strong emphasis is also placed upon experiential learning during overseas field trips that can be taken as part of the capstone requirement of this intensive major.

Ecology and biodiversity research requires extensive scientific knowledge as well as passion, and students are encouraged to take more than the requisite 12-credit minimum of capstone courses. Through these courses, and the range of formal field-based options as well as various extra-curricular activities offered, students will be expected to develop expertise in one or a few groups of plants or animals; this is an important skill since an ability to identify species and major taxa is an essential prerequisite for biodiversity scientists or conservation biologists.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the local, regional and global environment, and how they interact; evaluate their role in ecosystem functioning and identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: assess, understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to assess, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research in top-level Universities around the world or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems in a changing world. (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

Major in Biological Sciences (Intensive)

Major in Ecology & Biodiversity

Minor in Ecology & Biodiversity

Required courses (144 credits)

1. Introductory level courses (60 credits) Disciplinary Core Courses: Science Foundation Courses (12 credits)

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SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core Courses (42 credits)		
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BIOL 1110 From molecules to cells (6) (Note 1)
BIOL 1309 Evolutionary diversity (6) (Note 1)
BIOL 2102 Biostatistics (6) (Note 1)
BIOL 2103 Biological sciences laboratory course (6) (Note 1)

BIOL2306 Ecology and evolution (6) (Note 1)

EASC1401 Blue Planet (6)

Environmental data analysis (6) (Note 1) ENVS2002

Disciplinary Electives (6 credits)

Plus at least 6 credits selected from the following courses:

CHEM1041 Foundations of chemistry (6) Take either CHEM1041 or CHEM1042 to fulfill this 6 credits requirement, but not both. CHEM1042 General chemistry I (6) Take either CHEM1041 or CHEM1042 to fulfill this 6 credits requirement, but not both.

2. Advanced level courses (66 to 72 credits) (Note 2) **Disciplinary Core Courses (30 credits)**

Animal behaviour (6) BIOL3101 BIOL3301 Marine biology (6) (Note 1) BIOL3302 Systematics and phylogenetics (6) (Note 1) BIOL3303 Conservation biology (6) BIOL3319 Tropical terrestrial ecology (6) (Note 1)

Disciplinary Electives (36 to 42 credits) (Note 2)

Plus at least 36 or 42 credits selected from the following courses:

Tropical and temperate marine ecology field course (6) **BIOL3305 BIOL3313** Freshwater ecology (6)

BIOL3314 Plant structure and evolution (6) Experimental intertidal ecology (6) **BIOL3318 BIOL3322** Marine invertebrate zoology (6)

BIOL3328 Nearshore marine and estuarine ecology (6)

BIOL3408 Genetics (6)

Insect ecology: the little things that run the world (6) BIOL3419

BIOL3506 Evolutionary biology (6) BIOL4301 Fish and fisheries (6)

BIOL4302 Environmental impact assessment (6) Ecosystem functioning and services (6) BIOL4304

BIOL4505 Oyster aquaculture (6) Urban ecology (6) ENVS3019 ENVS3020 Global change ecology (6)

3. Capstone requirement (12 to 18 credits) (Note 2)

Disciplinary Core Courses (12 credits)

BIOI 4991 Ecology & biodiversity project (12)

Disciplinary Electives (6 credits)

BIOL3991 Directed studies in ecology & biodiversity (6) BIOL4911 Conservation science in practice (6)

Notes:

1. These are core courses in the regular Ecology & Biodiversity Major (96 credits) curriculum.

2. Within the E&B accredited curriculum, students have to pass a total of 60 credits within the Introductory Level Courses spread across two Science Foundation Courses (Level 1; 12 credits), seven Disciplinary Core Courses (Levels 1 & 2; 42 credits) and one chemistry (Level 1; 6 credits). For the chemistry course, students will have the choice between CHEM1041 and CHEM1042 in function of their prior chemistry background acquired during their upper secondary education. Students with no chemistry background should follow CHEM1041, while students with previous chemistry background should take CHEM1042.

Advanced Level Courses cover a total of 66 to 72 credits. Those are divided between five Disciplinary Core Courses (Level 3; 30 credits) and 6 to 7 Disciplinary Elective Courses (Level 3 & 4; 36 to 42 credits) among a choice of fourteen different courses. As eight of the Disciplinary Elective courses are being taught every other year, students must pay attention to the year during which these courses are taught and ensure that they have fulfilled the necessary requirements. There is a student mentorship programme in place that can assist them in this

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Finally, students who participate in student exchange programme are expected to enquire, prior to their departure from HKU, about potential equivalences with the courses taken during exchange programmes to ensure that they match requirements for obtaining the RSB accredited programme.

Remarks:

Major Title Major in Ecology & Biodiversity (Intensive)

2016

Offered to students

admitted to Year 1 in

Objectives:

This intensive major is directed at teaching students the 'rules of existence' for organisms in natural and human-modified environments, including major threats to biodiversity and the approaches adopted to conserve species and habitats. Special reference is made to the plants, animals and habitats of Hong Kong and Asia, the ways in which humans have altered the region's ecosystems, and the management or mitigation of those impacts. The range and scope of courses offered will provide students with a firm foundation in ecology, biodiversity and related disciplines, and equip them with the skills required for postgraduate research or employment with government and non-government organizations concerned with biodiversity conservation, nature preservation or habitat assessment and management.

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Ecology and biodiversity research requires extensive scientific knowledge as well as passion, and students are encouraged to take more than the requisite 12-credit minimum of capstone courses. Through these courses, and the range of formal field-based options as well as various extra-curricular activities offered, students will be expected to develop expertise in one or a few groups of plants or animals; this is an important skill since an ability to identify species and major taxa is an essential prerequisite for biodiversity scientists or conservation biologists.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the local, regional and global environment, and how they interact; evaluate their role in ecosystem functioning and identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: assess, understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to assess, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research in top-level Universities around the world or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems in a changing world. (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

Major in Biological Sciences (Intensive)

Major in Ecology & Biodiversity

Minor in Ecology & Biodiversity

Required courses (144 credits)

1. Introductory level courses (60 credits) Disciplinary Core Courses: Science Foundation Courses (12 credits)

Disciplinary Core Courses (42 credits)		
SCNC1112	Fundamentals of modern science (6)	(Note 1)
SCNC1111	Scientific method and reasoning (6)	(Note 1)

BIOL 1110 From molecules to cells (6) (Note 1)
BIOL 1309 Evolutionary diversity (6) (Note 1)
BIOL 2102 Biostatistics (6) (Note 1)
BIOL 2103 Biological sciences laboratory course (6) (Note 1)

BIOL2306 Ecology and evolution (6) (Note 1)

EASC1401 Blue Planet (6)

ENVS2002 Environmental data analysis (6) (Note 1)

Disciplinary Electives (6 credits)

Plus at least 6 credits selected from the following courses:

CHEM1041 Foundations of chemistry (6) Take either CHEM1041 or CHEM1042 to fulfill this 6 credits requirement, but not both.

CHEM1042 General chemistry I (6) Take either CHEM1041 or CHEM1042 to

fulfill this 6 credits requirement, but not both.

2. Advanced level courses (66 to 72 credits) (Note 2)

Disciplinary Core Courses (30 credits)

BIOL 3101 Animal behaviour (6)

BIOL 3301 Marine biology (6) (Note 1)

BIOL 3302 Systematics and phylogenetics (6) (Note 1)

BIOL 3303 Conservation biology (6)

BIOL 3319 Tropical terrestrial ecology (6) (Note 1)

Disciplinary Electives (36 to 42 credits) (Note 2)

Plus at least 36 or 42 credits selected from the following courses:

BIOL3305 Tropical and temperate marine ecology field course (6)
BIOL3313 Freshwater ecology (6)
BIOL3314 Plant structure and evolution (6)

BIOL3314 Plant structure and evolution (6)
BIOL3318 Experimental intertidal ecology (6)
BIOL3322 Marine invertebrate zoology (6)

BIOL3328 Nearshore marine and estuarine ecology (6)

BIOL3408 Genetics (6)

BIOL3419 Insect ecology: the little things that run the world (6)

BIOL3506 Evolutionary biology (6) BIOL4301 Fish and fisheries (6)

BIOL4302 Environmental impact assessment (6)
BIOL4304 Ecosystem functioning and services (6)

BIOL4505 Oyster aquaculture (6)
ENVS3019 Urban ecology (6)
ENVS3020 Global change ecology (6)

3. Capstone requirement (12 to 18 credits) (Note 2)

Disciplinary Core Courses (12 credits)

BIOL4991 Ecology & biodiversity project (12)

Disciplinary Electives (6 credits)

BIOL3991 Directed studies in ecology & biodiversity (6)
BIOL4911 Conservation science in practice (6)

Notes:

1. These are core courses in the regular Ecology & Biodiversity Major (96 credits) curriculum.

2. Within the E&B accredited curriculum, students have to pass a total of 60 credits within the Introductory Level Courses spread across two Science Foundation Courses (Level 1; 12 credits), seven Disciplinary Core Courses (Levels 1 & 2; 42 credits) and one chemistry (Level 1; 6 credits). For the chemistry course, students will have the choice between CHEM1041 and CHEM1042 in function of their prior chemistry background acquired during their upper secondary education. Students with no chemistry background should follow CHEM1041, while students with previous chemistry background should take CHEM1042.

Advanced Level Courses cover a total of 66 to 72 credits. Those are divided between five Disciplinary Core Courses (Level 3; 30 credits) and 6 to 7 Disciplinary Elective Courses (Level 3 & 4; 36 to 42 credits) among a choice of fourteen different courses. As eight of the Disciplinary Elective courses are being taught every other year, students must pay attention to the year during which these courses are taught and ensure that they have fulfilled the necessary requirements. There is a student mentorship programme in place that can assist them in this.

During their final year, students should complete a minimum of 12 credits as Capstone Courses (maximum of 18). The Ecology & Biodiversity Project (12 credits) is mandatory and students can choose to complete one of the other two Elective Capstone Courses (6 credits). If students choose to complete 18 credits of Capstone Courses, then they are required to complete only 36 credits of Disciplinary Elective Courses within the Advanced Level Courses (instead of 42 credits)

Finally, students who participate in student exchange programme are expected to enquire, prior to their departure from HKU, about potential equivalences with the courses taken during exchange programmes to ensure that they match requirements for obtaining the RSB accredited programme.

Remarks:

Major Title Major in Ecology & Biodiversity (Intensive)

2015

Offered to students

admitted to Year 1 in

Objectives:

This intensive major is directed at teaching students the 'rules of existence' for organisms in natural and human-modified environments, including major threats to biodiversity and the approaches adopted to conserve species and habitats. Special reference is made to the plants, animals and habitats of Hong Kong and Asia, the ways in which humans have altered the region's ecosystems, and the management or mitigation of those impacts. The range and scope of courses offered will provide students with a firm foundation in ecology, biodiversity and related disciplines, and equip them with the skills required for postgraduate research or employment with government and non-government organizations concerned with biodiversity conservation, nature preservation or habitat assessment and management.

The intensive major is based around an introductory core that emphasizes biology, ecology and evolution of plants and animals; it includes a compulsory residential field trip (as part of the Ecology and Evolution course), as well as instruction in data analysis and biostatistics. Many of the advanced courses in the major have a strong emphasis on field-work and on small projects performed by students. They teach students about the ecology and biodiversity of different ecosystems (e.g. marine, terrestrial, freshwater and urban) and taxa (e.g. flowering plants, insects, fishes, marine mammals). Other courses focus on more applied topics, such as environmental impact assessment, conservation, and provide an opportunity for students to become familiar with specialised topics ranging from systematics to animal behaviour.

During their final year, students have an opportunity to conduct independent research in the form of an ecology and biodiversity research project or a directed-studies dissertation under the close supervision of an individual staff member. Students are able to make use of the facilities of the Swire Institute of Marine Science for such work. Strong emphasis is also placed upon experiential learning during overseas field trips that can be taken as part of the capstone requirement of this intensive major.

Ecology and biodiversity research requires extensive scientific knowledge as well as passion, and students are encouraged to take more than the requisite 12-credit minimum of capstone courses. Through these courses, and the range of formal field-based options as well as various extra-curricular activities offered, students will be expected to develop expertise in one or a few groups of plants or animals; this is an important skill since an ability to identify species and major taxa is an essential prerequisite for biodiversity scientists or conservation biologists.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and appreciate the major living and non-living components of the local, regional and global environment, and how they interact; evaluate their role in ecosystem functioning and identify threats to them; and know how these threats can be mitigated (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: assess, understand and appreciate the variety of life in Hong Kong's and Southeast Asia's natural habitats, become equipped to assess, study, manage and protect that diversity, and appraise the related moral and ethical issues (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: have sufficient experience of the basic techniques of modern ecological science and prepare to learn new ones for specific tasks (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: use IT tools appropriately, and access and evaluate materials from libraries, archives and the Internet (by means of coursework, laboratory-based, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: demonstrate original, independent and critical thinking, with mastery of a range of communication skills (by means of coursework, project-based and presentation opportunities in the curriculum)
- PLO 6: have the skill and knowledge to pursue postgraduate ecological research in top-level Universities around the world or to develop a career in nature conservation and environmental education, especially in Hong Kong and southern China (by means of coursework, tutorial classes, project-based and research-based learning in the curriculum)
- PLO 7: be motivated and sufficiently equipped to apply the knowledge solve local, regional and global environmental problems in a changing world. (by means of coursework, laboratory-based, tutorial classes, capstone learning and/or project-based learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

Major in Ecology & Biodiversity

Minor in Ecology & Biodiversity

Required courses (144 credits) 1. Introductory level courses (60 credits) Disciplinary Core Courses: Science Foundation Courses (12 credits) SCNC1111 Scientific method and reasoning (6) (Note 1) Fundamentals of modern science (6) **SCNC1112** (Note 1) **Disciplinary Core Courses (42 credits)** From molecules to cells (6) (Note 1) BIOL1110 Evolutionary diversity (6) BIOL1309 (Note 1) BIOL2102 Biostatistics (6) (Note 1) Biological sciences laboratory course (6) (Note 1) BIOL2103 Ecology and evolution (6) (Note 1) **BIOL2306**

Blue Planet (6) EASC1401

Environmental data analysis (6) ENVS2002 (Note 1)

Disciplinary Electives (6 credits)

Plus at least 6 credits selected from the following courses:

CHEM1041 Foundations of chemistry (6) Take either CHEM1041 or CHEM1042 to fulfill this 6 credits requirement, but not both. Take either CHEM1041 or CHEM1042 to CHEM1042 General chemistry I (6) fulfill this 6 credits requirement, but not both.

2. Advanced level courses (66 to 72 credits) (Note 2)

Disciplinary Core Courses (30 credits) Animal behaviour (6) BIOL3101

Marine biology (6) BIOL3301 BIOL3302 Systematics and phylogenetics (6) (Note 1) BIOL3303 Conservation biology (6) (Note 1)

BIOL3319 Tropical terrestrial ecology (6) Disciplinary Electives (36 to 42 credits) (Note 2)

Plus at least 36 or 42 credits selected from the following courses:

BIOL3305 Tropical and temperate marine ecology field course (6)

BIOL3313 Freshwater ecology (6) Plant structure and evolution (6) **BIOL3314** BIOL3318 Experimental intertidal ecology (6) Marine invertebrate zoology (6) **BIOL3322**

BIOL3328 Nearshore marine and estuarine ecology (6) Insect ecology: the little things that run the world (6) BIOL3419

BIOL3506 Evolutionary biology (6) Fish and fisheries (6) BIOL4301

BIOL4302 Environmental impact assessment (6) **BIOL4304** Ecosystem functioning and services (6)

Oyster aquaculture (6) **BIOI 4505** Urban ecology (6) ENVS3019 ENVS3020 Global change ecology (6)

3. Capstone requirement (12 to 18 credits) (Note 2)

Disciplinary Core Courses (12 credits)

Ecology & biodiversity project (12) BIOL4991

Disciplinary Electives (6 credits)

BIOL3991 Directed studies in ecology & biodiversity (6)

BIOL4911 Conservation science in practice (6)

Notes:

1. These are core courses in the regular Ecology & Biodiversity Major (96 credits) curriculum.

2. Within the E&B accredited curriculum, students have to pass a total of 60 credits within the Introductory Level Courses spread across two Science Foundation Courses (Level 1; 12 credits), seven Disciplinary Core Courses (Levels 1 & 2; 42 credits) and one chemistry (Level 1; 6 credits). For the chemistry course, students will have the choice between CHEM1041 and CHEM1042 in function of their prior chemistry background acquired during their upper secondary education. Students with no chemistry background should follow CHEM1041, while students with previous chemistry background should take CHEM1042.

Advanced Level Courses cover a total of 66 to 72 credits. Those are divided between five Disciplinary Core Courses (Level 3; 30 credits) and 6 to 7 Disciplinary Elective Courses (Level 3 & 4; 36 to 42 credits) among a choice of fourteen different courses. As eight of the Disciplinary Elective courses are being taught every other year, students must pay attention to the year during which these courses are taught and ensure that they have fulfilled the necessary requirements. There is a student mentorship programme in place that can assist them in this.

During their final year, students should complete a minimum of 12 credits as Capstone Courses (maximum of 18). The Ecology & Biodiversity Project (12 credits) is mandatory and students can choose to complete one of the other two Elective Capstone Courses (6 credits). If students choose to complete 18 credits of Capstone Courses, then they are required to complete only 36 credits of Disciplinary Elective Courses within the Advanced Level Courses (instead of 42 credits)

Finally, students who participate in student exchange programme are expected to enquire, prior to their departure from HKU, about potential equivalences with the courses taken during exchange programmes to ensure that they match requirements for obtaining the RSB accredited programme.

Remarks:

Major Title Major in Environmental Science

Offered to students 2020

admitted to Year 1 in

Objectives:

The Major in Environmental Science aims to provide students with a strong scientific and technological background for understanding and addressing the environmental issues faced by humankind. This includes a flexible teaching and learning programme so that students can explore environmental issues from a range of aspects. Core courses in the curriculum emphasize fundamental knowledge in life and environment, physical and sustainable environment, pollution, monitoring and management. Throughout the curriculum, students are encouraged to undertake their own independent study from primary and secondary sources to incorporate critical thinking, field and laboratory work, documentary and archive scholarship, as integrated elements of relevant courses. By completing the curriculum, students are expected to have enhanced their knowledge in environmental science and have improved their problem-solving ability, communication and social skills. Students will be prepared to work in industries and government agencies, where they will help manage wisely the resources for which they are responsible.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain an advanced level of skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods and appreciation of the related ethical issues (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Minor in Environmental Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

CHEM1042 General chemistry I (6)

ENVS1401 Introduction to environmental science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses (Level 1 & 2):

EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

ENVS1301 Environmental life science (6)

BIOL2102 Biostatistics (6)

BIOL2306 Ecology and evolution (6)

CHEM2241 Analytical chemistry I (6)

2. Advanced level courses (42 credits) Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from the following courses:

BIOL3109 Environmental microbiology (6)
BIOL3110 Environmental toxicology (6)
BIOL3217 Food, environment and health (6)
BIOL3303 Conservation biology (6)
CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

EASC3020 Global change: anthropogenic impacts (6)
EASC3405 Environmental remote sensing (6)
EASC3419 Earth System Science Field Studies (6)
ENVS3007 Natural hazards and mitigation (6)
ENVS3010 Sustainable energy and environment (6)

ENVS3019 Urban ecology (6) ENVS3020 Global change ecology (6)

ENVS3022 Environmental science field course (6)

ENVS3028 Coastal Sustainability (6)

ENVS3042 Pollution (6)

May take either ENVS1301 or BIOL2306 to fulfill this 12 credits requirement, but not both.

May take either ENVS1301 or BIOL2306 to fulfill this 12 credits requirement, but not both.

ENVS3202 Plant physiology and climate change (6) ENVS3313 Environmental oceanography (6)

ENVS3401 Understanding tropical ecosystems in a changing world (6)

ENVS3401 Onderstanding dopical ecosystems in a changing world (c)

ENVS3402 Qualitative data, social science methods and decision-making

in environmental science (6)
BIOL4302 Environmental impact assessment (6)
ENVS4110 Environmental remediation (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

ENVS3999 Directed studies in environmental science (6)

ENVS4966 Environmental science internship (6) ENVS4999 Environmental science project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Major Title Major in Environmental Science

Offered to students 2019

admitted to Year 1 in

Objectives:

The Major in Environmental Science aims to provide students with a strong scientific and technological background for understanding and addressing the environmental issues faced by humankind. This includes a flexible teaching and learning programme so that students can explore environmental issues from a range of aspects. Core courses in the curriculum emphasize fundamental knowledge in life and environment, physical and sustainable environment, pollution, monitoring and management. Throughout the curriculum, students are encouraged to undertake their own independent study from primary and secondary sources to incorporate critical thinking, field and laboratory work, documentary and archive scholarship, as integrated elements of relevant courses. By completing the curriculum, students are expected to have enhanced their knowledge in environmental science and have improved their problem-solving ability, communication and social skills. Students will be prepared to work in industries and government agencies, where they will help manage wisely the resources for which they are responsible.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain an advanced level of skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods and appreciation of the related ethical issues (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Minor in Environmental Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

CHEM1042 General chemistry I (6)

ENVS1401 Introduction to environmental science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses (Level 1 & 2):

EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

ENVS1301 Environmental life science (6)

BIOL2102 Biostatistics (6)

BIOL2306 Ecology and evolution (6)

CHEM2241 Analytical chemistry I (6)

2. Advanced level courses (42 credits) Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from the following courses:

BIOL3109 Environmental microbiology (6)
BIOL3110 Environmental toxicology (6)
BIOL3217 Food, environment and health (6)
BIOL3303 Conservation biology (6)
CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

EASC3020 Global change: anthropogenic impacts (6)
EASC3405 Environmental remote sensing (6)
EASC3419 Earth System Science Field Studies (6)
ENVS3007 Natural hazards and mitigation (6)
ENVS3010 Sustainable energy and environment (6)

ENVS3019 Urban ecology (6) ENVS3020 Global change ecology (6)

ENVS3022 Environmental science field course (6)

ENVS3028 Coastal Sustainability (6)

ENVS3042 Pollution (6)

May take either ENVS1301 or BIOL2306 to fulfill this 12 credits requirement, but not both.

May take either ENVS1301 or BIOL2306 to fulfill this 12 credits requirement, but not both.

ENVS3202 Plant physiology and climate change (6)

ENVS3313 Environmental oceanography (6)

ENVS3401 Understanding tropical ecosystems in a changing world (6) ENVS3402 Qualitative data, social science methods and decision-making

in environmental science (6)
BIOL4302 Environmental impact assessment (6)
ENVS4110 Environmental remediation (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

ENVS3999 Directed studies in environmental science (6)

ENVS4966 Environmental science internship (6) ENVS4999 Environmental science project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Environmental Science

Offered to students 2018

admitted to Year 1 in

Objectives:

The Major in Environmental Science aims to provide students with a strong scientific and technological background for understanding and addressing the environmental issues faced by humankind. This includes a flexible teaching and learning programme so that students can explore environmental issues from a range of aspects. Core courses in the curriculum emphasize fundamental knowledge in life and environment, physical and sustainable environment, pollution, monitoring and management. Throughout the curriculum, students are encouraged to undertake their own independent study from primary and secondary sources to incorporate critical thinking, field and laboratory work, documentary and archive scholarship, as integrated elements of relevant courses. By completing the curriculum, students are expected to have enhanced their knowledge in environmental science and have improved their problem-solving ability, communication and social skills. Students will be prepared to work in industries and government agencies, where they will help manage wisely the resources for which they are responsible.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain an advanced level of skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods and appreciation of the related ethical issues (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Minor in Environmental Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

CHEM1042 General chemistry I (6)

ENVS1401 Introduction to environmental science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses (Level 1 & 2):

EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

ENVS1301 Environmental life science (6)

BIOL2102 Biostatistics (6)

BIOL2306 Ecology and evolution (6)

CHEM2241 Analytical chemistry I (6)

2. Advanced level courses (42 credits) Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from the following courses:

BIOL3109 Environmental microbiology (6)
BIOL3110 Environmental toxicology (6)
BIOL3217 Food, environment and health (6)
BIOL3303 Conservation biology (6)
CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

EASC3020 Global change: anthropogenic impacts (6)
EASC3405 Environmental remote sensing (6)
EASC3419 Earth System Science Field Studies (6)
ENVS3007 Natural hazards and mitigation (6)
ENVS3010 Sustainable energy and environment (6)

ENVS3019 Urban ecology (6) ENVS3020 Global change ecology (6)

ENVS3022 Environmental science field course (6)

ENVS3028 Coastal Sustainability (6)

ENVS3042 Pollution (6)

May take either ENVS1301 or BIOL2306 to fulfill this 12 credits requirement, but not both.

May take either ENVS1301 or BIOL2306 to fulfill this 12 credits requirement, but not both.

ENVS3202 Plant physiology and climate change (6)

ENVS3313 Environmental oceanography (6)

ENVS3401 Understanding tropical ecosystems in a changing world (6) ENVS3402 Qualitative data, social science methods and decision-making

in environmental science (6)
BIOL4302 Environmental impact assessment (6)
ENVS4110 Environmental remediation (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

ENVS3999 Directed studies in environmental science (6)

ENVS4966 Environmental science internship (6) ENVS4999 Environmental science project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Environmental Science

Offered to students 2017

admitted to Year 1 in

Objectives:

The Major in Environmental Science aims to provide students with a strong scientific and technological background for understanding and addressing the environmental issues faced by humankind. This includes a flexible teaching and learning programme so that students can explore environmental issues from a range of aspects. Core courses in the curriculum emphasize fundamental knowledge in life and environment, physical and sustainable environment, pollution, monitoring and management. Throughout the curriculum, students are encouraged to undertake their own independent study from primary and secondary sources to incorporate critical thinking, field and laboratory work, documentary and archive scholarship, as integrated elements of relevant courses. By completing the curriculum, students are expected to have enhanced their knowledge in environmental science and have improved their problem-solving ability, communication and social skills. Students will be prepared to work in industries and government agencies, where they will help manage wisely the resources for which they are responsible.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain an advanced level of skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods and appreciation of the related ethical issues (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Minor in Environmental Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (18 credits)

ENVS1401 Introduction to environmental science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses (Level 1 & 2):

CHEM1042 General chemistry I (6)

EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

ENVS1301 Environmental life science (6) STAT1601 Elementary statistical methods (6)

STAT1603 Introductory statistics (6)

BIOL2102 Biostatistics (6)

BIOL2306 Ecology and evolution (6) CHEM2041 Principles of chemistry (6) CHEM2241 Analytical chemistry I (6)

CHEM2442 Fundamentals of organic chemistry (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from the following courses:

BIOL3109 Environmental microbiology (6)
BIOL3110 Environmental toxicology (6)
BIOL3217 Food, environment and health (6)
BIOL3303 Conservation biology (6)
CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3242 Food and water analysis (6)

EASC3020 Global change: anthropogenic impacts (6)
EASC3405 Environmental remote sensing (6)
EASC3419 Earth System Science Field Studies (6)
ENVS3007 Natural hazards and mitigation (6)
ENVS3010 Sustainable energy and environment (6)

May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both. May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both.

ENVS3019	Urban ecology (6)
ENVS3020	Global change ecology (6)
ENVS3022	Environmental science field course (6)
ENVS3028	Coastal Sustainability (6)
ENVS3042	Pollution (6)
ENVS3202	Plant physiology and climate change (6)
ENVS3313	Environmental oceanography (6)
ENVS3401	Understanding tropical ecosystems in a changing world (6)
ENVS3402	Qualitative data, social science methods and decision-making in environmental science (6)
MATH3408	Computational methods and differential equations with applications (6)
STAT3611	Computer-aided data analysis (6)
BIOL4302	Environmental impact assessment (6)
ENVS4110	Environmental remediation (6)
3. Capstone requirem	ent (6 credits)
At least 6 credits se	lected from the following courses:

At least 6 credits selected from the following courses:

ENVS3999 Directed studies in environmental science (6) ENVS4966 Environmental science internship (6)

ENVS4999 Environmental science project (12)

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc svllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Environmental Science

Offered to students 2016

admitted to Year 1 in

Objectives:

The Major in Environmental Science aims to provide students with a strong scientific and technological background for understanding and addressing the environmental issues faced by humankind. This includes a flexible teaching and learning programme so that students can explore environmental issues from a range of aspects. Core courses in the curriculum emphasize fundamental knowledge in life and environment, physical and sustainable environment, pollution, monitoring and management. Throughout the curriculum, students are encouraged to undertake their own independent study from primary and secondary sources to incorporate critical thinking, field and laboratory work, documentary and archive scholarship, as integrated elements of relevant courses. By completing the curriculum, students are expected to have enhanced their knowledge in environmental science and have improved their problem-solving ability, communication and social skills. Students will be prepared to work in industries and government agencies, where they will help manage wisely the resources for which they are responsible.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain an advanced level of skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods and appreciation of the related ethical issues (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Minor in Environmental Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (18 credits)

ENVS1401 Introduction to environmental science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses (Level 1 & 2):

CHEM1042 General chemistry I (6)

EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

ENVS1301 Environmental life science (6) STAT1601 Elementary statistical methods (6)

STAT1603 Introductory statistics (6)

BIOL2102 Biostatistics (6)

BIOL2306 Ecology and evolution (6) CHEM2041 Principles of chemistry (6) CHEM2241 Analytical chemistry I (6)

CHEM2442 Fundamentals of organic chemistry (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from the following courses:

BIOL3109 Environmental microbiology (6)
BIOL3110 Environmental toxicology (6)
BIOL3217 Food, environment and health (6)
BIOL3303 Conservation biology (6)
CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3242 Food and water analysis (6)

EASC3020 Global change: anthropogenic impacts (6)
EASC3405 Environmental remote sensing (6)
EASC3419 Earth System Science Field Studies (6)
ENVS3007 Natural hazards and mitigation (6)
ENVS3010 Sustainable energy and environment (6)

May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both. May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both.

ENVS3019	Urban ecology (6)	
ENVS3020	Global change ecology (6)	
ENVS3022	Environmental science field course (6)	
ENVS3028	Coastal Sustainability (6)	
ENVS3042	Pollution (6)	
ENVS3202	Plant physiology and climate change (6)	
ENVS3313	Environmental oceanography (6)	
ENVS3401	Understanding tropical ecosystems in a changing world (6)	
ENVS3402	Qualitative data, social science methods and decision-making in environmental science (6)	
MATH3408	Computational methods and differential equations with applications (6)	
STAT3611	Computer-aided data analysis (6)	
BIOL4302	Environmental impact assessment (6)	
ENVS4110	Environmental remediation (6)	
3. Capstone requirement (6 credits)		
At least 6 credits selected from the following courses:		

ENVS3999 Directed studies in environmental science (6) ENVS4966 Environmental science internship (6)

ENVS4999 Environmental science project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Environmental Science

Offered to students 2015

admitted to Year 1 in

Objectives:

The Major in Environmental Science aims to provide students with a strong scientific and technological background for understanding and addressing the environmental issues faced by humankind. This includes a flexible teaching and learning programme so that students can explore environmental issues from a range of aspects. Core courses in the curriculum emphasize fundamental knowledge in life and environment, physical and sustainable environment, pollution, monitoring and management. Throughout the curriculum, students are encouraged to undertake their own independent study from primary and secondary sources to incorporate critical thinking, field and laboratory work, documentary and archive scholarship, as integrated elements of relevant courses. By completing the curriculum, students are expected to have enhanced their knowledge in environmental science and have improved their problem-solving ability, communication and social skills. Students will be prepared to work in industries and government agencies, where they will help manage wisely the resources for which they are responsible.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain an advanced level of skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods and appreciation of the related ethical issues (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Minor in Environmental Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (18 credits)

ENVS1401 Introduction to environmental science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses (Level 1 & 2):

CHEM1042 General chemistry I (6)

EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

ENVS1301 Environmental life science (6) STAT1601 Elementary statistical methods (6)

STAT1603 Introductory statistics (6)

BIOL2102 Biostatistics (6)

BIOL2306 Ecology and evolution (6) CHEM2041 Principles of chemistry (6) CHEM2241 Analytical chemistry I (6)

CHEM2442 Fundamentals of organic chemistry (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from the following courses:

BIOL3109 Environmental microbiology (6)
BIOL3110 Environmental toxicology (6)
BIOL3217 Food, environment and health (6)
BIOL3303 Conservation biology (6)
CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3242 Food and water analysis (6)

EASC3020 Global change: anthropogenic impacts (6)
EASC3405 Environmental remote sensing (6)
EASC3419 Earth System Science Field Studies (6)
ENVS3007 Natural hazards and mitigation (6)
ENVS3010 Sustainable energy and environment (6)

May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both. May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both.

ENVS3019	Urban ecology (6)	
ENVS3020	Global change ecology (6)	
ENVS3028	Coastal Sustainability (6)	
ENVS3022	Environmental science field course (6)	
ENVS3042	Pollution (6)	
ENVS3202	Plant physiology and climate change (6)	
ENVS3313	Environmental oceanography (6)	
ENVS3401	Understanding tropical ecosystems in a changing world (6)	
ENVS3402	Qualitative data, social science methods and decision-making in environmental science (6)	
MATH3408	Computational methods and differential equations with applications (6)	
STAT3611	Computer-aided data analysis (6)	
BIOL4302	Environmental impact assessment (6)	
ENVS4110	Environmental remediation (6)	
3. Capstone requirement (6 credits)		
At least 6 credits selected from the following courses:		
ENVS3999	Directed studies in environmental science (6)	
ENVS4966	Environmental science internship (6)	
ENVS4999	Environmental science project (12)	

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Environmental Science

2014

Offered to students

admitted to Year 1 in

Objectives:

The Major in Environmental Science aims to provide students with a strong scientific and technological background for understanding and addressing the environmental issues faced by humankind. This includes a flexible teaching and learning programme so that students can explore environmental issues from a range of aspects. Core courses in the curriculum emphasize fundamental knowledge in life and environment, physical and sustainable environment, pollution, monitoring and management. Throughout the curriculum, students are encouraged to undertake their own independent study from primary and secondary sources to incorporate critical thinking, field and laboratory work, documentary and archive scholarship, as integrated elements of relevant courses. By completing the curriculum, students are expected to have enhanced their knowledge in environmental science and have improved their problem-solving ability, communication and social skills. Students will be prepared to work in industries and government agencies, where they will help manage wisely the resources for which they are responsible.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- gain an advanced level of skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods and appreciation of the related ethical issues (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Minor in Environmental Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (18 credits)

ENVS1401 Introduction to environmental science (6) Methods in environmental science (6) ENVS2001 ENVS2002 Environmental data analysis (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses (Level 1 & 2):

General chemistry I (6) CHEM1042

Introduction to climate science (6) FASC1020

EASC1401 Blue Planet (6)

ENVS1301 Environmental life science (6) Elementary statistical methods (6) STAT1601

STAT1603 Introductory statistics (6)

Biostatistics (6) BIOL2102

Ecology and evolution (6) BIOL2306 Principles of chemistry (6) CHEM2041 CHEM2241 Analytical chemistry I (6)

CHEM2442 Fundamentals of organic chemistry (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (6 credits)

Environment, society and economics (6) FNVS3004

Disciplinary Electives (36 credits)

At least 36 credits selected from the following courses:

BIOL3110 Environmental toxicology (6) Conservation biology (6) **BIOL3303** CHEM3141 Environmental chemistry (6)

Analytical chemistry II: chemical instrumentation (6) CHEM3241

CHEM3242 Food and water analysis (6)

EASC3020 Global change: anthropogenic impacts (6) EASC3405 Environmental remote sensing (6) **ENVS3006** Environmental radiation (6) Natural hazards and mitigation (6) ENVS3007 ENVS3010 Sustainable energy and environment (6)

ENVS3019 Urban ecology (6)

Global change ecology (6) ENVS3020

May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both. May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both. ENVS3042 Pollution (6)

ENVS3313 Environmental oceanography (6)

MATH3408 Computational methods and differential equations with

applications (6)

STAT3611 Computer-aided data analysis (6)
BIOL4302 Environmental impact assessment (6)
ENVS4110 Environmental remediation (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

ENVS3999 Directed studies in environmental science (6)
ENVS4955 Environmental science in practice (6)
ENVS4966 Environmental science internship (6)
ENVS4999 Environmental science project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks

Major Title Major in Environmental Science

Offered to students 2013

admitted to Year 1 in

Objectives:

The Major in Environmental Science aims to provide students with a strong scientific and technological background for understanding and addressing the environmental issues faced by humankind. This includes a flexible teaching and learning programme so that students can explore environmental issues from a range of aspects. Core courses in the curriculum emphasize fundamental knowledge in life and environment, physical and sustainable environment, pollution, monitoring and management. Throughout the curriculum, students are encouraged to undertake their own independent study from primary and secondary sources to incorporate critical thinking, field and laboratory work, documentary and archive scholarship, as integrated elements of relevant courses. By completing the curriculum, students are expected to have enhanced their knowledge in environmental science and have improved their problem-solving ability, communication and social skills. Students will be prepared to work in industries and government agencies, where they will help manage wisely the resources for which they are responsible.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain an advanced level of skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods and appreciation of the related ethical issues (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Minor in Environmental Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (18 credits)

ENVS1401 Introduction to environmental science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses (Level 1 & 2):

CHEM1042 General chemistry I (6)

EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

ENVS1301 Environmental life science (6) STAT1601 Elementary statistical methods (6)

STAT1603 Introductory statistics (6)

BIOL2102 Biostatistics (6)

BIOL2306 Ecology and evolution (6) CHEM2041 Principles of chemistry (6) CHEM2241 Analytical chemistry I (6)

CHEM2442 Fundamentals of organic chemistry (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from the following courses:

BIOL3110 Environmental toxicology (6)
BIOL3303 Conservation biology (6)
CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3242 Food and water analysis (6)

EASC3020 Global change: anthropogenic impacts (6)
EASC3405 Environmental remote sensing (6)
ENVS3006 Environmental radiation (6)
ENVS3007 Natural hazards and mitigation (6)
ENVS3010 Sustainable energy and environment (6)

ENVS3019 Urban ecology (6) ENVS3020 Global change ecology (6) May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both. May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both.

ENVS3042 Pollution (6)

ENVS3313 Environmental oceanography (6)

MATH3408 Computational methods and differential equations with

applications (6)

STAT3611 Computer-aided data analysis (6)
BIOL4302 Environmental impact assessment (6)
ENVS4110 Environmental remediation (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

ENVS3999 Directed studies in environmental science (6)
ENVS4955 Environmental science in practice (6)
ENVS4966 Environmental science internship (6)
ENVS4999 Environmental science project (12)

Notes

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Environmental Science

Offered to students 2012

admitted to Year 1 in

Objectives:

The Major in Environmental Science aims to provide students with a strong scientific and technological background for understanding and addressing the environmental issues faced by humankind. This includes a flexible teaching and learning programme so that students can explore environmental issues from a range of aspects. Core courses in the curriculum emphasize fundamental knowledge in life and environment, physical and sustainable environment, pollution, monitoring and management. Throughout the curriculum, students are encouraged to undertake their own independent study from primary and secondary sources to incorporate critical thinking, field and laboratory work, documentary and archive scholarship, as integrated elements of relevant courses. By completing the curriculum, students are expected to have enhanced their knowledge in environmental science and have improved their problem-solving ability, communication and social skills. Students will be prepared to work in industries and government agencies, where they will help manage wisely the resources for which they are responsible.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain an advanced level of skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods and appreciation of the related ethical issues (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Minor in Environmental Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (12 credits)

ENVS1401 Introduction to environmental science (6) STAT1601 Elementary statistical methods (6)

STAT1603 Introductory statistics (6)

May take either STAT1601 or STAT1603 to fulfill this 12 credits requirement, but not both. May take either STAT1601 or STAT1603 to fulfill this 12 credits requirement, but not both.

Disciplinary Electives (24 credits)

At least 12 credits selected from the following courses (Level 1) in List A:

List A
CHEM1042 General chemistry I (6)

EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

ENVS1301 Environmental life science (6)

At least 12 credits selected from the following courses (Level 2) in List B:

List B

BIOL2102 Biostatistics (6)

BIOL2306 Ecology and evolution (6) CHEM2041 Principles of chemistry (6) CHEM2241 Analytical chemistry I (6)

CHEM2442 Fundamentals of organic chemistry (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)

ENVS2001 Methods in environmental science (6) ENVS2002 Environmental data analysis (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from the following courses:

BIOL3110 Environmental toxicology (6)
BIOL3303 Conservation biology (6)
CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3242 Food and water analysis (6)

EASC3020 Global change: anthropogenic impacts (6)
EASC3405 Environmental remote sensing (6)
ENVS3006 Environmental radiation (6)

ENVS3007 Natural hazards and mitigation (6) ENVS3010 Sustainable energy and environment (6)

ENVS3019 Urban ecology (6)

ENVS3020 Global change ecology (6)

ENVS3042 Pollution (6)

ENVS3313 Environmental oceanography (6)

MATH3408 Computational methods and differential equations with

applications (6)

STAT3611 Computer-aided data analysis (6)
BIOL4302 Environmental impact assessment (6)
ENVS4110 Environmental remediation (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

ENVS3999 Directed studies in environmental science (6)
ENVS4955 Environmental science in practice (6)
ENVS4966 Environmental science internship (6)
ENVS4999 Environmental science project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Food & Nutritional Science

Offered to students 2020

admitted to Year 1 in

Objectives:

The Major in Food and Nutritional Science aims to offer an exciting, dynamic, and challenging environment to prepare the students for career opportunities in food and nutritional science. The goals of the programme are to provide the students with: (a) critical knowledge and understanding of the theoretical and practical aspects of food science and technology, and nutrition and their relationship to human health; (b) critical knowledge and understanding on the relationship between food and a wide range of social, legal, technological and environmental factors; (c) a curriculum meeting the requirements for higher degree in MPhil and PhD and or the taught Master of Science degrees in the field of Food industry: Management and Marketing, Food Safety and Toxicology and the postgraduate diploma related to health sciences. The curriculum is designed for students to select studies in Nutrition and Public Health in preparation for postgraduate diploma in dietetics or human nutrition. Study in Food Security is an innovative programme that entails scientific and social approach in food, nutrition and environment, allowing students to relate global challenges in industry, society and government levels.

The mission is to provide a progressive and effective programme that integrates theoretical and experiential learning to better prepare students for the challenges of the workplace. Throughout the curriculum, there is consistent emphasis on experiential learning through laboratory studies, internship training, research-based learning, debate and presentations, which are designed to enhance students' critical thinking, communication and collaboration, tackling of ill-defined problems, development of individual learning objectives and self-evaluation of performance. Internship experiences can be gained in medical and health sectors, schools, industries, government and community setting. Students graduated from this programme are prepared for diverse careers in the food industry, government or private-sector food and nutrition agencies, and scientific research laboratories, health-care and fitness facilities, hospitals, nutrition edition and communication enterprises.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand the science underpinning food and nutrition as applied to diet and health, and to food production (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: analyze controversial food related issues such as GM foods, nutritional labeling and food sustainability (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand ethical perspectives and practice in all areas of food product development, food safety and public health nutrition, and appreciate and identify the need for ethical standards and professional codes of conduct (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: apply and disseminate scientific knowledge obtained from food, nutrition and related biosciences for the understanding of the influences in nutrition, health and disease of a community using a range of formats and approaches (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: apply independent thinking and the principles of scientific enquiry to conduct a small research project to test a food-and/or nutrition-related hypothesis (by means of coursework, tutorial classes, laboratory-based and project-based learning in the curriculum)
- PLO 6: demonstrate communication and teamwork skills necessary to working in a multi-disciplinary environment (by means of coursework and group-project learning in the curriculum)

Impermissible Combinations:

Minor in Food & Nutritional Science

Required courses (96 credits)

1. Introductory level courses (60 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

BIOL1110 From molecules to cells (6)
BIOL1201 Introduction to food and nutrition (6)
BIOL2101 Principles of food chemistry (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

Basic biochemistry (6)

BIOL2220 Principles of biochemistry (6)

this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. Take either BIOL2220 or BIOC2600 to fulfill

Take either BIOL2220 or BIOC2600 to fulfill

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

Disciplinary Electives (12 credits)

BIOC2600

At least 12 credits of introductory level course from the list below, of which at least 6 credits of CHEMXXXX from the list below:

CHEM1042 General chemistry I (6)

CHEM2442 Fundamentals of organic chemistry (6) GEOG2013 Sustainable development (6)

GEOG2030 Global development (6)

2. Advanced level courses (30 credits) Disciplinary Core Courses (12 credits)

BIOL3202 Nutritional biochemistry (6)

BIOL3203 Food microbiology (6)

Disciplinary Electives (18 credits)

At least 12 credits of advanced level BIOL3XXX and/or BIOL4XXX course from the list below:

BIOL3204 Nutrition and the life cycle (6)
BIOL3205 Human physiology (6)
BIOL3207 Principles of toxicology (6)
BIOL3209 Food and nutrient analysis (6)

BIOL3211 Nutrigenomics (6)

BIOL3216 Food waste management (6)
BIOL3217 Food, environment and health (6)
BIOL3218 Food hygiene and quality control (6)

BIOL3606 Diet and disease (6)
BIOL3608 Food commodities (6)
BIOL4201 Public health nutrition (6)

BIOL4202 Nutrition and sports performance (6)

BIOL4205 Food technology (6) BIOL4209 Functional foods (6)

BIOL4411 Plant and food biotechnology (6)
BIOC3606 Molecular medicine (6)
STAT3617 Sample survey methods (6)
GEOG3202 GIS in environmental studies (6)
POLI3121 Environmental policy (6)
BBMS4004 Public health genetics (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3992 Directed studies in food & nutritional science (6)
BIOL4922 Food product development and evaluation (6)
BIOL4962 Food & nutritional science internship (6)
BIOL4992 Food & nutritional science project (12)

Notes

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Those who want to specialize in the Nutrition and Public Health Studies should pass the following course: Introduction level courses 2 Disciplinary Core Courses: Science Foundation: SCNC1111 and SCNC1112; 6 Disciplinary Core Courses: BIOL1110, BIOL2101, BIOL2101; BIOL2102, BIOL2103, BIOL2220 or BIOC2600; 2 Disciplinary Electives: CHEM1042 and CHEM2442. Advanced level courses 2 Disciplinary Core Courses: BIOL3202 and BIOL3203; any 3 Disciplinary Electives with at least 2 must be at BIOL3XXX and/or BIOL4XXX in the list: BIOL3204, BIOL3205, BIOL3207, BIOL3209, BIOL3211, BIOL3217, BIOL3503, BIOL3606, BIOL4201, BIOL4202, BIOL4209, BIOC3606, STAT3617, and BBMS4004. Capstone requirement: any 1 Capstone Course: BIOL3992, BIOL4922, BIOL4962, and BIOL4992.
- 5. Those who want to specialize in the Food Security Studies should pass the following course: Introduction level courses 2 Disciplinary Core Courses: Science Foundation: SCNC1111 and SCNC1112; 6 Disciplinary Core Courses: BIOL1110, BIOL2101, BIOL2101; BIOL2102, BIOL2103, BIOL2220 or BIOC2600; 2 Disciplinary Electives: GEOG2013 and GEOG2030. Advanced level courses 2 Disciplinary Core Courses: BIOL3202 and BIOL3203; any 3 Disciplinary Electives with at least 2 must be at BIOL3XXX and/or BIOL4XXX in the list: BIOL3207, BIOL3216, BIOL3217, BIOL3218, BIOL3606, BIOL3608, BIOL4201, BIOL4205, BIOL4209, BIOL4411, ENVS3019, GEOG3202, POLI3121; STAT3617, and BBMS4004. Capstone requirement: any 1 Capstone Course: BIOL3992, BIOL4962, and BIOL4992.
- 6. Students who may wish to pursue postgraduate study in dietetics are strongly advised to consult their academic and course selection advisor. Students are recommended to take BIOL1110, BBMS1001, CHEM1042 and CHEM2442 in Year 1/2 of the study. Students should also take BIOL3204, BIOL3503 and one Level 3/4 courses related to molecular biology.
- 7. Specialisation recognition will be allowed for 2014-2018 student intake. Students who already took CHEM1041 do not need to take CHEM1042 and CHEM2441 do not need to take CHEM2442.
- 8. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Major Title Major in Food & Nutritional Science

Offered to students 2019

admitted to Year 1 in

Objectives:

The Major in Food and Nutritional Science aims to offer an exciting, dynamic, and challenging environment to prepare the students for career opportunities in food and nutritional science. The goals of the programme are to provide the students with: (a) critical knowledge and understanding of the theoretical and practical aspects of food science and technology, and nutrition and their relationship to human health; (b) critical knowledge and understanding on the relationship between food and a wide range of social, legal, technological and environmental factors; (c) a curriculum meeting the requirements for higher degree in MPhil and PhD and or the taught Master of Science degrees in the field of Food industry: Management and Marketing, Food Safety and Toxicology and the postgraduate diploma related to health sciences. The curriculum is designed for students to select studies in Nutrition and Public Health in preparation for postgraduate diploma in dietetics or human nutrition. Study in Food Security is an innovative programme that entails scientific and social approach in food, nutrition and environment, allowing students to relate global challenges in industry, society and government levels.

The mission is to provide a progressive and effective programme that integrates theoretical and experiential learning to better prepare students for the challenges of the workplace. Throughout the curriculum, there is consistent emphasis on experiential learning through laboratory studies, internship training, research-based learning, debate and presentations, which are designed to enhance students' critical thinking, communication and collaboration, tackling of ill-defined problems, development of individual learning objectives and self-evaluation of performance. Internship experiences can be gained in medical and health sectors, schools, industries, government and community setting. Students graduated from this programme are prepared for diverse careers in the food industry, government or private-sector food and nutrition agencies, and scientific research laboratories, health-care and fitness facilities, hospitals, nutrition edition and communication enterprises.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand the science underpinning food and nutrition as applied to diet and health, and to food production (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: analyze controversial food related issues such as GM foods, nutritional labeling and food sustainability (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand ethical perspectives and practice in all areas of food product development, food safety and public health nutrition, and appreciate and identify the need for ethical standards and professional codes of conduct (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: apply and disseminate scientific knowledge obtained from food, nutrition and related biosciences for the understanding of the influences in nutrition, health and disease of a community using a range of formats and approaches (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: apply independent thinking and the principles of scientific enquiry to conduct a small research project to test a food-and/or nutrition-related hypothesis (by means of coursework, tutorial classes, laboratory-based and project-based learning in the curriculum)
- PLO 6: demonstrate communication and teamwork skills necessary to working in a multi-disciplinary environment (by means of coursework and group-project learning in the curriculum)

Impermissible Combinations:

Minor in Food & Nutritional Science

Required courses (96 credits)

1. Introductory level courses (60 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

BIOL1110 From molecules to cells (6)
BIOL1201 Introduction to food and nutrition (6)
BIOL2101 Principles of food chemistry (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

BIOC2600 Basic biochemistry (6) Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both.

BIOL2220 and BIOC2600 are mutually exclusive.

ex

Disciplinary Electives (12 credits)

At least 12 credits of introductory level course from the list below, of which at least 6 credits of CHEMXXXX from the list below:

CHEM1042 General chemistry I (6)

CHEM2442 Fundamentals of organic chemistry (6) GEOG2013 Sustainable development (6)

GEOG2030 Global development (6)

2. Advanced level courses (30 credits) Disciplinary Core Courses (12 credits)

BIOL3202 Nutritional biochemistry (6)

BIOL3203 Food microbiology (6)

Disciplinary Electives (18 credits)

At least 12 credits of advanced level BIOL3XXX and/or BIOL4XXX course from the list below:

BIOL3204 Nutrition and the life cycle (6)
BIOL3205 Human physiology (6)
BIOL3207 Principles of toxicology (6)
BIOL3209 Food and nutrient analysis (6)

BIOL3211 Nutrigenomics (6)

BIOL3216 Food waste management (6)
BIOL3217 Food, environment and health (6)
BIOL3218 Food hygiene and quality control (6)

BIOL3606 Diet and disease (6)
BIOL3608 Food commodities (6)
BIOL4201 Public health nutrition (6)

BIOL4202 Nutrition and sports performance (6)

BIOL4205 Food technology (6) BIOL4209 Functional foods (6)

BIOL4411 Plant and food biotechnology (6)
BIOC3606 Molecular medicine (6)
STAT3617 Sample survey methods (6)
GEOG3202 GIS in environmental studies (6)
POLI3121 Environmental policy (6)
BBMS4004 Public health genetics (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3992 Directed studies in food & nutritional science (6)
BIOL4922 Food product development and evaluation (6)
BIOL4962 Food & nutritional science internship (6)
BIOL4992 Food & nutritional science project (12)

Notes

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 5. Those who want to specialize in the Nutrition and Public Health Studies should pass the following course: Introduction level courses 2 Disciplinary Core Courses: Science Foundation: SCNC1111 and SCNC1112; 6 Disciplinary Core Courses: BIOL1110, BIOL2101, BIOL2101; BIOL2102, BIOL2103, BIOL2220 or BIOC2600; 2 Disciplinary Electives: CHEM1042 and CHEM2442. Advanced level courses 2 Disciplinary Core Courses: BIOL3202 and BIOL3203; any 3 Disciplinary Electives with at least 2 must be at BIOL3XXX and/or BIOL4XXX in the list: BIOL3204, BIOL3205, BIOL3207, BIOL3209, BIOL3211, BIOL3217, BIOL3503, BIOL3606, BIOL4201, BIOL4202, BIOC3606, STAT3617, and BBMS4004. Capstone requirement: any 1 Capstone Course: BIOL3992, BIOL4922, BIOL4962, and BIOL4992.
- 6. Those who want to specialize in the Food Security Studies should pass the following course: Introduction level courses 2 Disciplinary Core Courses: Science Foundation: SCNC1111 and SCNC1112; 6 Disciplinary Core Courses: BIOL1110, BIOL2101, BIOL2101; BIOL2102, BIOL2103, BIOL2220 or BIOC2600; 2 Disciplinary Electives: GEOG2013 and GEOG2030. Advanced level courses 2 Disciplinary Core Courses: BIOL3202 and BIOL3203; any 3 Disciplinary Electives with at least 2 must be at BIOL3XXX and/or BIOL4XXX in the list: BIOL3207, BIOL3216, BIOL3217, BIOL3218, BIOL3606, BIOL3608, BIOL4201, BIOL4205, BIOL4209, BIOL4411, ENVS3019, GEOG3202, POLI3121; STAT3617, and BBMS4004. Capstone requirement: any 1 Capstone Course: BIOL3992, BIOL4922, BIOL4962, and BIOL4992.
- 7. Students who may wish to pursue postgraduate study in dietetics are strongly advised to consult their academic and course selection advisor. Students are recommended to take BIOL1110, BBMS1001, CHEM1042 and CHEM2442 in Year 1/2 of the study. Students should also take BIOL3204, BIOL3503 and one Level 3/4 courses related to molecular biology.
- 8. Specialisation recognition will be allowed for 2014-2018 student intake. Students who already took CHEM1041 do not need to take CHEM1042 and CHEM2441 do not need to take CHEM2442.

Remarks

Major Title Major in Food & Nutritional Science

Offered to students 2018

admitted to Year 1 in

Objectives:

The Major in Food and Nutritional Science aims to offer an exciting, dynamic, and challenging environment to prepare the students for career opportunities in food and nutritional science. The goals of the programme are to provide the students with: (a) critical knowledge and understanding of the theoretical and practical aspects of food science and technology, and nutrition and their relationship to human health; (b) critical knowledge and understanding on the relationship between food and a wide range of social, legal, technological and environmental factors; (c) a curriculum meeting the requirements for higher degree in MPhil and PhD and or the taught Master of Science degrees in the field of Food industry: Management and Marketing, Food Safety and Toxicology and the postgraduate diploma in dietetics.

The mission is to provide a progressive and effective programme that integrates theoretical and experiential learning to better prepare students for the challenges of the workplace. Throughout the curriculum, there is consistent emphasis on experiential learning through laboratory studies, internship training, research-based learning, debate and presentations, which are designed to enhance students' critical thinking, communication and collaboration, tackling of ill-defined problems, development of individual learning objectives and self-evaluation of performance. Internship experiences can be gained in medical centers, schools, industries, government and community setting. Students graduated from this programme are prepared for diverse careers in the food industry, government or private-sector food and nutrition agencies, and scientific research laboratories, health-care and fitness facilities, hospitals, nutrition edition and communication enterprises.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand the science underpinning food and nutrition as applied to diet and health, and to commercial food production (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: analyze controversial food related issues such as GM foods, nutritional labeling and food security (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand ethical perspectives and practice in all areas of food product development, food safety and public health nutrition, and appreciate and identify the need for ethical standards and professional codes of conduct (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: apply and disseminate scientific knowledge obtained from food, nutrition and related biosciences for the understanding of the influences of nutrition in health and disease, using a range of formats and approaches (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: apply independent thinking and the principles of scientific enquiry to conduct a small research project to test a food-and/or nutrition-related hypothesis (by means of coursework, tutorial classes, laboratory-based and project-based learning in the curriculum)
- PLO 6: demonstrate communication and teamwork skills necessary to working in a multi-disciplinary environment (by means of coursework and group-project learning in the curriculum)

Impermissible Combinations:

Minor in Food & Nutritional Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Scientific method and reasoning (6) Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

BIOL1110 From molecules to cells (6)
BIOL1201 Introduction to food and nutrition (6)
BIOL2101 Principles of food chemistry (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

BIOC2600 Basic biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive

2. Advanced level courses (42 credits)

Disciplinary Core Courses (18 credits)

BIOL3202 Nutritional biochemistry (6)
BIOL3203 Food microbiology (6)
BIOL3209 Food and nutrient analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses: BIOL3204 Nutrition and the life cycle (6)

BIOL3205 Human physiology (6)
BIOL3206 Clinical nutrition (6)

Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually exclusive.

Principles of toxicology (6)

BIOL3207		[previous title: Food and nutritional toxicology
BIOL3211	Nutrigenomics (6)	(6)]
BIOL3215	Principles of dietary assessment (6)	
BIOL3216	Food waste management (6)	
BIOL3217	Food, environment and health (6)	
BIOL3218	Food hygiene and quality control (6)	
BIOL3606	Diet and disease (6)	Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually exclusive.
BIOL3608	Food commodities (6)	Take either BIOL3608 or BIOL4208 to fulfill this 24 credits requirement, but not both. BIOL3608 and BIOL4208 are mutually exclusive.
BIOL4201	Public health nutrition (6)	0.0.00.00
BIOL4202	Nutrition and sports performance (6)	
BIOL4205	Food technology (6)	[previous title: Food processing and
		engineering (6)]
BIOL4208	Meat, dairy and grain sciences (6)	Take either BIOL3608 or BIOL4208 to fulfill this 24 credits requirement, but not both. BIOL3608 and BIOL4208 are mutually exclusive.
BIOL4209	Functional foods (6)	
BIOL4411	Plant and food biotechnology (6)	
3. Capstone requir	rement (6 credits)	
At least 6 credits	s selected from the following courses:	
BIOL3992	Directed studies in food & nutritional science (6)	
BIOL4913	Advanced practicum on food and nutrient analysis (6)	
BIOL4922	Food product development and evaluation (6)	
BIOL4962	Food & nutritional science internship (6)	
BIOL4992	Food & nutritional science project (12)	

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students who wish to specialize in a certain area may choose to emphasize selection of courses from the following lists:
- (a) Food Science and Technology: BIOL3608; BIOL3207; BIOL3209; BIOL3216; BIOL3218; BIOL4205; BIOL4208; BIOL4209; BIOL4411; BIOL4913; BIOL4922.
- (b) Nutrition and Health Science: BIOL3204; BIOL3205; BIOL3206; BIOL3207; BIOL3211; BIOL3215; BIOL3217; BIOL3218; BIOL3606; BIOL4201; BIOL4202.
- 6. Students who may wish to pursue postgraduate study in dietetics are strongly advised to consult their academic and course selection advisors regarding additional courses in Physiology and Biochemistry.

Remarks

Major Title Major in Food & Nutritional Science 2017

Offered to students

admitted to Year 1 in

Objectives:

The Major in Food and Nutritional Science aims to offer an exciting, dynamic, and challenging environment to prepare the students for career opportunities in food and nutritional science. The goals of the programme are to provide the students with: (a) critical knowledge and understanding of the theoretical and practical aspects of food science and technology, and nutrition and their relationship to human health; (b) critical knowledge and understanding on the relationship between food and a wide range of social, legal, technological and environmental factors; (c) a curriculum meeting the requirements for higher degree in MPhil and PhD and or the taught Master of Science degrees in the field of Food industry: Management and Marketing, Food Safety and Toxicology and the postgraduate diploma in dietetics.

The mission is to provide a progressive and effective programme that integrates theoretical and experiential learning to better prepare students for the challenges of the workplace. Throughout the curriculum, there is consistent emphasis on experiential learning through laboratory studies, internship training, research-based learning, debate and presentations, which are designed to enhance students' critical thinking, communication and collaboration, tackling of ill-defined problems, development of individual learning objectives and self-evaluation of performance. Internship experiences can be gained in medical centers, schools, industries, government and community setting. Students graduated from this programme are prepared for diverse careers in the food industry, government or private-sector food and nutrition agencies, and scientific research laboratories, health-care and fitness facilities, hospitals, nutrition edition and communication enterprises.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand the science underpinning food and nutrition as applied to diet and health, and to commercial food production (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: analyze controversial food related issues such as GM foods, nutritional labeling and food security (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand ethical perspectives and practice in all areas of food product development, food safety and public health nutrition, and appreciate and identify the need for ethical standards and professional codes of conduct (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: apply and disseminate scientific knowledge obtained from food, nutrition and related biosciences for the understanding of the influences of nutrition in health and disease, using a range of formats and approaches (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: apply independent thinking and the principles of scientific enquiry to conduct a small research project to test a foodand/or nutrition-related hypothesis (by means of coursework, tutorial classes, laboratory-based and project-based learning in the curriculum)
- PLO 6: demonstrate communication and teamwork skills necessary to working in a multi-disciplinary environment (by means of coursework and group-project learning in the curriculum)

Impermissible Combinations:

Minor in Food & Nutritional Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

Scientific method and reasoning (6) SCNC1111 SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

BIOL1110 From molecules to cells (6) Introduction to food and nutrition (6) BIOL1201 BIOL2101 Principles of food chemistry (6)

Biostatistics (6) BIOL2102

BIOL2103 Biological sciences laboratory course (6)

Principles of biochemistry (6) **BIOL2220**

BIOC2600 Basic biochemistry (6) Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive

2. Advanced level courses (42 credits)

Disciplinary Core Courses (18 credits)

BIOL3202 Nutritional biochemistry (6) Food microbiology (6) BIOL3203 Food and nutrient analysis (6) BIOL3209

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses: Nutrition and the life cycle (6) **BIOI 3204**

Human physiology (6) BIOL3205 Clinical nutrition (6) BIOL3206

Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually exclusive.

Principles of toxicology (6)

BIOL3207		[previous title: Food and nutritional toxicology (6)]	
BIOL3211	Nutrigenomics (6)	(0)]	ı
BIOL3211	Principles of dietary assessment (6)		ı
BIOL3216	Food waste management (6)		ı
BIOL3217	Food, environment and health (6)		ı
BIOL3217	Food hygiene and quality control (6)		ı
BIOL3606	Diet and disease (6)	Take either BIOL3206 or BIOL3606 to fulfill	ı
DIOL3000	Diet and disease (b)	this 24 credits requirement, but not both.	ı
		BIOL3206 and BIOL3606 are mutually	ı
		exclusive.	ı
BIOL3608	Food commodities (6)	Take either BIOL3608 or BIOL4208 to fulfill	ı
		this 24 credits requirement, but not both.	ı
		BIOL3608 and BIOL4208 are mutually	ı
BIOL4201	Public health nutrition (6)	exclusive.	ı
	• ,		ı
BIOL4202 BIOL4205	Nutrition and sports performance (6) Food technology (6)	[previous title: Food processing and	ı
BIOL4205	Food technology (6)	engineering (6)]	ı
BIOL4208	Meat, dairy and grain sciences (6)	Take either BIOL3608 or BIOL4208 to fulfill	ı
DIOL ILOO	,, g (5)	this 24 credits requirement, but not both.	ı
		BIOL3608 and BIOL4208 are mutually	ı
		exclusive.	ı
BIOL4209	Functional foods (6)		ı
BIOL4411	Plant and food biotechnology (6)		ı
3. Capstone requirement (6 credits)			
	selected from the following courses:		ı
BIOL3992	Directed studies in food & nutritional science (6)		
BIOL4913	Advanced practicum on food and nutrient analysis (6)		
BIOL4922	Food product development and evaluation (6)		ı
BIOL4962	Food & nutritional science internship (6)		
BIOL4992	Food & nutritional science project (12)		
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Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students who wish to specialize in a certain area may choose to emphasize selection of courses from the following lists:
- (a) Food Science and Technology: BIOL3608; BIOL3207; BIOL3209; BIOL3216; BIOL3218; BIOL4205; BIOL4208; BIOL4209; BIOL4411; BIOL4913; BIOL4922.
- (b) Nutrition and Health Science: BIOL3204; BIOL3205; BIOL3206; BIOL3207; BIOL3211; BIOL3215; BIOL3217; BIOL3218; BIOL3606; BIOL4201; BIOL4202.
- 6. Students who may wish to pursue postgraduate study in dietetics are strongly advised to consult their academic and course selection advisors regarding additional courses in Physiology and Biochemistry.

Remarks:

Major Title Major in Food & Nutritional Science 2016

Offered to students

admitted to Year 1 in

Objectives:

The Major in Food and Nutritional Science aims to offer an exciting, dynamic, and challenging environment to prepare the students for career opportunities in food and nutritional science. The goals of the programme are to provide the students with: (a) critical knowledge and understanding of the theoretical and practical aspects of food science and technology, and nutrition and their relationship to human health; (b) critical knowledge and understanding on the relationship between food and a wide range of social, legal, technological and environmental factors; (c) a curriculum meeting the requirements for higher degree in MPhil and PhD and or the taught Master of Science degrees in the field of Food industry: Management and Marketing, Food Safety and Toxicology and the postgraduate diploma in dietetics.

The mission is to provide a progressive and effective programme that integrates theoretical and experiential learning to better prepare students for the challenges of the workplace. Throughout the curriculum, there is consistent emphasis on experiential learning through laboratory studies, internship training, research-based learning, debate and presentations, which are designed to enhance students' critical thinking, communication and collaboration, tackling of ill-defined problems, development of individual learning objectives and self-evaluation of performance. Internship experiences can be gained in medical centers, schools, industries, government and community setting. Students graduated from this programme are prepared for diverse careers in the food industry, government or private-sector food and nutrition agencies, and scientific research laboratories, health-care and fitness facilities, hospitals, nutrition edition and communication enterprises.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand the science underpinning food and nutrition as applied to diet and health, and to commercial food production (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: analyze controversial food related issues such as GM foods, nutritional labeling and food security (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand ethical perspectives and practice in all areas of food product development, food safety and public health nutrition, and appreciate and identify the need for ethical standards and professional codes of conduct (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: apply and disseminate scientific knowledge obtained from food, nutrition and related biosciences for the understanding of the influences of nutrition in health and disease, using a range of formats and approaches (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: apply independent thinking and the principles of scientific enquiry to conduct a small research project to test a foodand/or nutrition-related hypothesis (by means of coursework, tutorial classes, laboratory-based and project-based learning in the curriculum)
- PLO 6: demonstrate communication and teamwork skills necessary to working in a multi-disciplinary environment (by means of coursework and group-project learning in the curriculum)

Impermissible Combinations:

Minor in Food & Nutritional Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

Scientific method and reasoning (6) SCNC1111 SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

From molecules to cells (6) BIOL1110 Introduction to food and nutrition (6) BIOL1201 BIOL1309 Evolutionary diversity (6)

Biostatistics (6) BIOL2102

BIOL2103 Biological sciences laboratory course (6)

Principles of biochemistry (6) **BIOL2220**

BIOC2600 Basic biochemistry (6) Take either BIOL2220 or BIOC2600 to fufill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL2220 or BIOC2600 to fufill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive

2. Advanced level courses (42 credits)

Disciplinary Core Courses (18 credits)

BIOL3201 Food chemistry (6) Nutritional biochemistry (6) BIOL3202 Food microbiology (6) BIOL3203

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses: Nutrition and the life cycle (6) BIOL3204

Human physiology (6) BIOL3205 Clinical nutrition (6) BIOL3206

Principles of toxicology (6)

Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually exclusive.

BIOL3207		[previous title: Food and nutritional toxicology
BIOL3208	Food safety and quality management (6)	(6)] Take either BIOL3208 or BIOL3218 to fufill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.
BIOL3209	Food and nutrient analysis (6)	
BIOL3210	Grain production and utilization (6)	Take either BIOL3210 or BIOL4208 to fufill this 24 credits requirement, but not both. BIOL3210 and BIOL4208 are mutually exclusive.
BIOL3211	Nutrigenomics (6)	
BIOL3215	Principles of dietary assessment (6)	
BIOL3216	Food waste management (6)	
BIOL3217	Food, environment and health (6)	
BIOL3218	Food hygiene and quality control (6)	Take either BIOL3208 or BIOL3218 to fufill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.
BIOL3606	Diet and disease (6)	Take either BIOL3206 or BIOL3606 to fulfill
	· ·	this 24 credits requirement, but not both.
		BIOL3206 and BIOL3606 are mutually
DIOL 0000	F 1 1'4' (0)	exclusive.
BIOL3608	Food commodities (6)	Take either BIOL3608 or BIOL4208 to fulfill this 24 credits requirement, but not both.
		BIOL3608 and BIOL4208 are mutually exclusive.
BIOL4201	Public health nutrition (6)	
BIOL4202	Nutrition and sports performance (6)	
BIOL4204	Diet, brain function and behavior (6)	
BIOL4205	Food technology (6)	[previous title: Food processing and
		engineering (6)]
BIOL4207	Meat and dairy sciences (6)	Take either BIOL4207 or BIOL4208 to fufill
		this 24 credits requirement, but not both.
		BIOL4207 and BIOL4208 are mutually exclusive.
BIOL4208	Meat, dairy and grain sciences (6)	Take either BIOL3210 or BIOL4208;
BIOL+200	meat, early and grain estations (e)	BIOL4207 or BIOL4208; BIOL3608 or BIOL4208 to fufill this 24 credits requirement, but not both. BIOL3210 and BIOL4208;
		BIOL4207 and BIOL4208; BIOL3608 and BIOL4208 are mutually exclusive.
BIOL4209	Functional foods (6)	DIOL4200 are mutually exclusive.
BIOL4209	Plant and food biotechnology (6)	
3. Capstone requir	3, ()	
	selected from the following courses:	
BIOL3992	Directed studies in food & nutritional science (6)	
BIOL4912	Sensory evaluation of food (6)	
BIOL4913	Advanced practicum on food and nutrient analysis (6)	
BIOL4922	Food product development and evaluation (6)	
BIOL4962	Food & nutritional science internship (6)	
BIOL4992	Food & nutritional science project (12)	
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Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 5. Students who wish to specialize in a certain area may choose to emphasize selection of courses from the following lists:
- (a) Food Science and Technology: BIOL3608; BIOL3207; BIOL3208 or BIOL3218; BIOL3209; BIOL3210 or BIOL4208; BIOL3216; BIOL4205; BIOL4207 or BIOL4208; BIOL4209; BIOL4411; BIOL4913; BIOL4922.
- (b) Nutrition and Health Science: BIOL3204; BIOL3205; BIOL3206; BIOL3207; BIOL3208 or BIOL3218; BIOL3211; BIOL3215; BIOL3217; BIOL3606; BIOL4201; BIOL4202.
- 6. Students who may wish to pursue postgraduate study in dietetics are strongly advised to consult their academic and course selection advisors regarding additional courses in Physiology and Biochemistry.

Major Title Major in Food & Nutritional Science

Offered to students 2015

admitted to Year 1 in

Objectives:

The Major in Food and Nutritional Science aims to offer an exciting, dynamic, and challenging environment to prepare the students for career opportunities in food and nutritional science. The goals of the programme are to provide the students with: (a) critical knowledge and understanding of the theoretical and practical aspects of food science and technology, and nutrition and their relationship to human health; (b) critical knowledge and understanding on the relationship between food and a wide range of social, legal, technological and environmental factors; (c) a curriculum meeting the requirements for higher degree in MPhil and PhD and or the taught Master of Science degrees in the field of Food industry: Management and Marketing, Food Safety and Toxicology and the postgraduate diploma in dietetics.

The mission is to provide a progressive and effective programme that integrates theoretical and experiential learning to better prepare students for the challenges of the workplace. Throughout the curriculum, there is consistent emphasis on experiential learning through laboratory studies, internship training, research-based learning, debate and presentations, which are designed to enhance students' critical thinking, communication and collaboration, tackling of ill-defined problems, development of individual learning objectives and self-evaluation of performance. Internship experiences can be gained in medical centers, schools, industries, government and community setting. Students graduated from this programme are prepared for diverse careers in the food industry, government or private-sector food and nutrition agencies, and scientific research laboratories, health-care and fitness facilities, hospitals, nutrition edition and communication enterprises.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand the science underpinning food and nutrition as applied to diet and health, and to commercial food production (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: analyze controversial food related issues such as GM foods, nutritional labeling and food security (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand ethical perspectives and practice in all areas of food product development, food safety and public health nutrition, and appreciate and identify the need for ethical standards and professional codes of conduct (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: apply and disseminate scientific knowledge obtained from food, nutrition and related biosciences for the understanding of the influences of nutrition in health and disease, using a range of formats and approaches (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: apply independent thinking and the principles of scientific enquiry to conduct a small research project to test a food-and/or nutrition-related hypothesis (by means of coursework, tutorial classes, laboratory-based and project-based learning in the curriculum)
- PLO 6: demonstrate communication and teamwork skills necessary to working in a multi-disciplinary environment (by means of coursework and group-project learning in the curriculum)

Impermissible Combinations:

Minor in Food & Nutritional Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

BIOL1110 From molecules to cells (6)
BIOL1201 Introduction to food and nutrition (6)
BIOL1309 Evolutionary diversity (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

BIOC2600 Basic biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

2. Advanced level courses (42 credits)

Disciplinary Core Courses (18 credits)

BIOL3201 Food chemistry (6)
BIOL3202 Nutritional biochemistry (6)
BIOL3203 Food microbiology (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses: BIOL3204 Nutrition and the life cycle (6)

BIOL3205 Human physiology (6) BIOL3206 Clinical nutrition (6)

Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually exclusive.

Principles of toxicology (6)

BIOL3207		[previous title: Food and nutritional toxicology
BIOL3208	Food safety and quality management (6)	(6)] Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.
BIOL3209	Food and nutrient analysis (6)	exclusive.
BIOL3210	Grain production and utilization (6)	Take either BIOL3210 or BIOL4208 to fulfill this 24 credits requirement, but not both. BIOL3210 and BIOL4208 are mutually exclusive.
BIOL3211	Nutrigenomics (6)	
BIOL3215	Principles of dietary assessment (6)	
BIOL3216	Food waste management (6)	
BIOL3217	Food, environment and health (6)	
BIOL3218	Food hygiene and quality control (6)	Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.
BIOL3606	Diet and disease (6)	Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually exclusive.
BIOL3608	Food commodities (6)	Take either BIOL3608 or BIOL4208 to fulfill this 24 credits requirement, but not both. BIOL3608 and BIOL4208 are mutually exclusive.
BIOL4201	Public health nutrition (6)	
BIOL4202	Nutrition and sports performance (6)	
BIOL4204	Diet, brain function and behavior (6)	
BIOL4205	Food technology (6)	[previous title: Food processing and engineering (6)]
BIOL4207	Meat and dairy sciences (6)	Take either BIOL4207 or BIOL4208 to fulfill this 24 credits requirement, but not both. BIOL4207 and BIOL4208 are mutually exclusive.
BIOL4208	Meat, dairy and grain sciences (6)	Take either BIOL3210 or BIOL4208; BIOL4207 or BIOL4208; BIOL3608 or BIOL4208 to fufill this 24 credits requirement, but not both. BIOL3210 and BIOL4208; BIOL4207 and BIOL4208; BIOL3608 and BIOL4208 are mutually exclusive.
BIOL4209	Functional foods (6)	, , , , , , , , , , , , , , , , , , , ,
BIOL4210	Food product development (6)	
BIOL4411	Plant and food biotechnology (6)	
3. Capstone requir		
	selected from the following courses:	
BIOL3992	Directed studies in food & nutritional science (6)	
BIOL4912	Sensory evaluation of food (6)	
BIOL4913	Advanced practicum on food and nutrient analysis (6)	
BIOL4922	Food product development and evaluation (6)	
BIOL4962	Food & nutritional science internship (6)	
BIOL4992	Food & nutritional science project (12)	

Notes:

- 1. BIOL4210 and BIOL4922 are mutually exclusive.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
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- (a) Food Science and Technology: BIOL3608; BIOL3207; BIOL3208 or BIOL3218; BIOL3209; BIOL3210 or BIOL4208; BIOL4208; BIOL4205; BIOL4207 or BIOL4208; BIOL4209; BIOL4210 or BIOL4922; BIOL4411; BIOL4913.
- (b) Nutrition and Health Science: BIOL3204; BIOL3205; BIOL3206; BIOL3207; BIOL3208 or BIOL3218; BIOL3211; BIOL3215; BIOL3217; BIOL3606; BIOL4201; BIOL4202.

7. Students who may wish to pursue postgraduate study in dietetics are strongly advised to consult their academic and course selection advisors regarding additional courses in Physiology and Biochemistry.

Major Title Major in Food & Nutritional Science 2014

Offered to students

admitted to Year 1 in

Objectives:

The Major in Food and Nutritional Science aims to offer an exciting, dynamic, and challenging environment to prepare the students for career opportunities in food and nutritional science. The goals of the programme are to provide the students with: (a) critical knowledge and understanding of the theoretical and practical aspects of food science and technology, and nutrition and their relationship to human health; (b) critical knowledge and understanding on the relationship between food and a wide range of social, legal, technological and environmental factors; (c) a curriculum meeting the requirements for higher degree in MPhil and PhD and or the taught Master of Science degrees in the field of Food industry: Management and Marketing, Food Safety and Toxicology and the postgraduate diploma in dietetics.

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Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand the science underpinning food and nutrition as applied to diet and health, and to commercial food production (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: analyze controversial food related issues such as GM foods, nutritional labeling and food security (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
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- PLO 4: apply and disseminate scientific knowledge obtained from food, nutrition and related biosciences for the understanding of the influences of nutrition in health and disease, using a range of formats and approaches (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
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- PLO 6: demonstrate communication and teamwork skills necessary to working in a multi-disciplinary environment (by means of coursework and group-project learning in the curriculum)

Impermissible Combinations:

Minor in Food & Nutritional Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

Scientific method and reasoning (6) SCNC1111 SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

From molecules to cells (6) BIOL1110 Introduction to food and nutrition (6) BIOL1201 BIOL1309 Evolutionary diversity (6)

Biostatistics (6) BIOL2102

BIOL2103 Biological sciences laboratory course (6)

Principles of biochemistry (6) **BIOL2220**

BIOC2600 Basic biochemistry (6) Take either BIOL2220 or BIOC2600 to fufill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL2220 or BIOC2600 to fufill this 36 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive

2. Advanced level courses (42 credits)

Disciplinary Core Courses (18 credits)

BIOL3201 Food chemistry (6) Nutritional biochemistry (6) BIOL3202 Food microbiology (6) BIOL3203

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses: Nutrition and the life cycle (6) **BIOI 3204**

Human physiology (6) BIOL3205 Clinical nutrition (6) BIOL3206

Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually

Principles of toxicology (6)

exclusive.

BIOL3207		[previous title: Food and nutritional toxicology
BIOL3208	Food safety and quality management (6)	(6)] Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusvie.
BIOL3209	Food and nutrient analysis (6)	
BIOL3210	Grain production and utilization (6)	Take either BIOL3210 or BIOL4208 to fulfill this 24 credits requirement, but not both. BIOL3210 and BIOL4208 are mutually exclusive.
BIOL3211	Nutrigenomics (6)	
BIOL3215	Principles of dietary assessment (6)	
BIOL3216	Food waste management (6)	
BIOL3217	Food, environment and health (6)	
BIOL3218	Food hygiene and quality control (6)	Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.
BIOL3606	Diet and disease (6)	Take either BIOL3206 or BIOL3606 to fulfill
	` ,	this 24 credits requirement, but not both.
		BIOL3206 and BIOL3606 are mutually
DIOL0000	For all assumes different (O)	exclusive.
BIOL3608	Food commodities (6)	Take either BIOL3608 or BIOL4208 to fulfill this 24 credits requirement, but not both.
		BIOL3608 and BIOL4208 are mutually
		exclusive.
BIOL4201	Public health nutrition (6)	
BIOL4202	Nutrition and sports performance (6)	
BIOL4204	Diet, brain function and behavior (6)	
BIOL4205	Food technology (6)	[previous title: Food processing and
		engineering (6)]
BIOL4207	Meat and dairy sciences (6)	BIOL4207 or BIOL4208 to fulfill this 24
		credits requirement, but not both. BIOL4207
BIOL4208	Meat, dairy and grain sciences (6)	and BIOL4208 are mutually exclusive. Take either BIOL3210 or BIOL4208;
DIOL4200	Meat, daily and grain sciences (0)	BIOL4207 or BIOL4208; BIOL3608 or
		BIOL4208 to fufill this 24 credits requirement,
		but not both. BIOL3210 and BIOL4208;
		BIOL4207 and BIOL4208; BIOL3608 and
DIOI 4000	Functional foods (C)	BIOL4208 are mutually exclusive.
BIOL4209	Functional foods (6)	
BIOL4210	Food product development (6)	
BIOL4411	Plant and food biotechnology (6)	
3. Capstone require		
	s selected from the following courses: Directed studies in food & nutritional science (6)	
BIOL3992	Sensory evaluation of food (6)	
BIOL4912	Advanced practicum on food and nutrient analysis (6)	
BIOL4913 BIOL4922	Food product development and evaluation (6)	
BIOL4922 BIOL4962	Food & nutritional science internship (6)	
BIOL4962 BIOL4992	Food & nutritional science project (12)	
DIOL4332	1 334 & Hattitional Solonios project (12)	

Notes:

- 1. BIOL4210 and BIOL4922 are mutually exclusive.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 6. Students who wish to specialize in a certain area may choose to emphasize selection of courses from the following lists:
- (a) Food Science and Technology: BIOL3608; BIOL3207; BIOL3208 or BIOL3218; BIOL3209; BIOL3210 or BIOL4208; BIOL3216; BIOL4205; BIOL4207 or BIOL4208; BIOL4209; BIOL4210 or BIOL4922; BIOL4411; BIOL4913.
- (b) Nutrition and Health Science: BIOL3204; BIOL3205; BIOL3206; BIOL3207; BIOL3208 or BIOL3218; BIOL3211; BIOL3215; BIOL3217; BIOL3206; BIOL4201; BIOL4202.
- 7. Students who may wish to pursue postgraduate study in dietetics are strongly advised to consult their academic and course selection

advisors regarding additional courses in Physiology and Biochemistry.

Major Title Major in Food & Nutritional Science

Offered to students 2013

admitted to Year 1 in

Objectives:

The Major in Food and Nutritional Science aims to offer an exciting, dynamic, and challenging environment to prepare the students for career opportunities in food and nutritional science. The goals of the programme are to provide the students with: (a) critical knowledge and understanding of the theoretical and practical aspects of food science and technology, and nutrition and their relationship to human health; (b) critical knowledge and understanding on the relationship between food and a wide range of social, legal, technological and environmental factors; (c) a curriculum meeting the requirements for higher degree in MPhil and PhD and or the taught Master of Science degrees in the field of Food industry: Management and Marketing, Food Safety and Toxicology and the postgraduate diploma in dietetics.

The mission is to provide a progressive and effective programme that integrates theoretical and experiential learning to better prepare students for the challenges of the workplace. Throughout the curriculum, there is consistent emphasis on experiential learning through laboratory studies, internship training, research-based learning, debate and presentations, which are designed to enhance students' critical thinking, communication and collaboration, tackling of ill-defined problems, development of individual learning objectives and self-evaluation of performance. Internship experiences can be gained in medical centers, schools, industries, government and community setting. Students graduated from this programme are prepared for diverse careers in the food industry, government or private-sector food and nutrition agencies, and scientific research laboratories, health-care and fitness facilities, hospitals, nutrition edition and communication enterprises.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand the science underpinning food and nutrition as applied to diet and health, and to commercial food production (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: analyze controversial food related issues such as GM foods, nutritional labeling and food security (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand ethical perspectives and practice in all areas of food product development, food safety and public health nutrition, and appreciate and identify the need for ethical standards and professional codes of conduct (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: apply and disseminate scientific knowledge obtained from food, nutrition and related biosciences for the understanding of the influences of nutrition in health and disease, using a range of formats and approaches (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: apply independent thinking and the principles of scientific enquiry to conduct a small research project to test a food-and/or nutrition-related hypothesis (by means of coursework, tutorial classes, laboratory-based and project-based learning in the curriculum)
- PLO 6: demonstrate communication and teamwork skills necessary to working in a multi-disciplinary environment (by means of coursework and group-project learning in the curriculum)

Impermissible Combinations:

Minor in Food & Nutritional Science

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Scientific method and reasoning (6) Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

BIOL1110 From molecules to cells (6)
BIOL1201 Introduction to food and nutrition (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

BIOC2600 Basic biochemistry (6)

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)
BIOL2306 Ecology and evolution (6)

2. Advanced level courses (42 credits)
Disciplinary Core Courses (18 credits)

BIOL3201 Food chemistry (6)
BIOL3202 Nutritional biochemistry (6)
BIOL3203 Food microbiology (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:
BIOL3204 Nutrition and the life cycle (6)
BIOL3205 Human physiology (6)

Clinical nutrition (6)

Take either BIOL2220 or BIOC2600 to fufill this 30 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL2220 or BIOC2600 to fufill this 30 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both.

BIOL3206		Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually
BIOL3207	Principles of toxicology (6)	exclusive. [previous title: Food and nutritional toxicology (6)]
BIOL3208	Food safety and quality management (6)	Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.
BIOL3209	Food and nutrient analysis (6)	5.0.00.7 6.
BIOL3210	Grain production and utilization (6)	Take either BIOL3210 or BIOL4208 to fulfill this 24 credits requirement, but not both. BIOL3210 and BIOL4208 are mutually exclusive.
BIOL3211	Nutrigenomics (6)	
BIOL3215	Principles of dietary assessment (6)	
BIOL3216	Food waste management (6)	
BIOL3217	Food, environment and health (6)	
BIOL3218	Food hygiene and quality control (6)	Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.
BIOL3606	Diet and disease (6)	Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually exclusive.
BIOL3608	Food commodities (6)	Take either BIOL3608 or BIOL4208 to fulfill this 24 credits requirement, but not both. BIOL3608 and BIOL4208 are mutually exclusive.
BIOL4201	Public health nutrition (6)	CXCIGGIVE.
BIOL4202	Nutrition and sports performance (6)	
BIOL4204	Diet, brain function and behavior (6)	
BIOL4205	Food technology (6)	[previous title: Food processing and
		engineering (6)]
BIOL4207	Meat and dairy sciences (6)	Take either BIOL4207 or BIOL4208 to fulfill this 24 credits requirement, but not both. BIOL4207 and BIOL4208 are mutually
		exclusive.
BIOL4208	Meat, dairy and grain sciences (6)	Take either BIOL3210 or BIOL4208; BIOL4207 or BIOL4208; BIOL3608 or
		BIOL4207 of BIOL4206, BIOL3608 of BIOL4208 to fufill this 24 credits requirement,
		but not both. BIOL3210 and BIOL4208:
		BIOL4207 and BIOL4208; BIOL3608 and
		BIOL4208 are mutually exclusive.
BIOL4209	Functional foods (6)	
BIOL4210	Food product development (6)	
BIOL4411	Plant and food biotechnology (6)	
3. Capstone require	ement (6 credits) selected from the following courses:	
BIOL3992	Directed studies in food & nutritional science (6)	
BIOL3992 BIOL4912	Sensory evaluation of food (6)	
BIOL4912	Advanced practicum on food and nutrient analysis (6)	
BIOL4922	Food product development and evaluation (6)	
BIOL4962	Food & nutritional science internship (6)	
BIOL4992	Food & nutritional science project (12)	

Notes:

- 1. BIOL4210 and BIOL4922 are mutually exclusive.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 6. Students who wish to specialize in a certain area may choose to emphasize selection of courses from the following lists:
- (a) Food Science and Technology: BIOL3608; BIOL3207; BIOL3208 or BIOL3218; BIOL3209; BIOL3210 or BIOL4208; BIOL3216; BIOL4205;

- BIOL4207 or BIOL4208; BIOL4209; BIOL4210 or BIOL4922; BIOL4411 ; BIOL4913.
 (b) Nutrition and Health Science: BIOL3204; BIOL3205; BIOL3206; BIOL3207; BIOL3208 or BIOL3218; BIOL3211; BIOL3215; BIOL3217; BIOL3606; BIOL4201; BIOL4202.
- 7. Students who may wish to pursue postgraduate study in dietetics are strongly advised to consult their academic and course selection advisors regarding additional courses in Physiology and Biochemistry.

Major Title Major in Food & Nutritional Science 2012

Offered to students

admitted to Year 1 in

Objectives:

The Major in Food and Nutritional Science aims to offer an exciting, dynamic, and challenging environment to prepare the students for career opportunities in food and nutritional science. The goals of the programme are to provide the students with: (a) critical knowledge and understanding of the theoretical and practical aspects of food science and technology, and nutrition and their relationship to human health; (b) critical knowledge and understanding on the relationship between food and a wide range of social, legal, technological and environmental factors; (c) a curriculum meeting the requirements for higher degree in MPhil and PhD and or the taught Master of Science degrees in the field of Food industry: Management and Marketing, Food Safety and Toxicology and the postgraduate diploma in dietetics.

The mission is to provide a progressive and effective programme that integrates theoretical and experiential learning to better prepare students for the challenges of the workplace. Throughout the curriculum, there is consistent emphasis on experiential learning through laboratory studies, internship training, research-based learning, debate and presentations, which are designed to enhance students' critical thinking, communication and collaboration, tackling of ill-defined problems, development of individual learning objectives and self-evaluation of performance. Internship experiences can be gained in medical centers, schools, industries, government and community setting. Students graduated from this programme are prepared for diverse careers in the food industry, government or private-sector food and nutrition agencies, and scientific research laboratories, health-care and fitness facilities, hospitals, nutrition edition and communication enterprises.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand the science underpinning food and nutrition as applied to diet and health, and to commercial food production (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: analyze controversial food related issues such as GM foods, nutritional labeling and food security (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand ethical perspectives and practice in all areas of food product development, food safety and public health nutrition, and appreciate and identify the need for ethical standards and professional codes of conduct (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: apply and disseminate scientific knowledge obtained from food, nutrition and related biosciences for the understanding of the influences of nutrition in health and disease, using a range of formats and approaches (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 5: apply independent thinking and the principles of scientific enquiry to conduct a small research project to test a foodand/or nutrition-related hypothesis (by means of coursework, tutorial classes, laboratory-based and project-based learning in the curriculum)
- PLO 6: demonstrate communication and teamwork skills necessary to working in a multi-disciplinary environment (by means of coursework and group-project learning in the curriculum)

Impermissible Combinations:

Minor in Food & Nutritional Science

Required courses	(96	credits)
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1. Introductory	level course	es (48 credits)
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Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

BIOL1110 From molecules to cells (6) BIOL1201 Introduction to food and nutrition (6)

BIOI 2102 Biostatistics (6)

Biological sciences laboratory course (6) BIOL2103

BIOL2220 Principles of biochemistry (6)

BIOL2306 Ecology and evolution (6) Basic biochemistry (6) BIOC2600

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 36 credits, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

2. Advanced level courses (42 credits)

Disciplinary Core Courses (18 credits)

BIOL3201 Food chemistry (6) BIOL3202 Nutritional biochemistry (6) Food microbiology (6) BIOL3203

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses: Nutrition and the life cycle (6) **BIOL3204**

Human physiology (6) **BIOL3205** BIOL3206 Clinical nutrition (6)

BIOL3207 Principles of toxicology (6)

Food safety and quality management (6)

Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually

[previous title: Food and nutritional toxicology

(6)1

BIOL3208		Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.
BIOL3209	Food and nutrient analysis (6)	exclusive.
BIOL3210	Grain production and utilization (6)	Take either BIOL3210 or BIOL4208 to fulfill this 24 credits requirement, but not both. BIOL3210 and BIOL4208 are mutually exclusive.
BIOL3211	Nutrigenomics (6)	
BIOL3215	Principles of dietary assessment (6)	
BIOL3216	Food waste management (6)	
BIOL3217	Food, environment and health (6)	
BIOL3218	Food hygiene and quality control (6)	Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually
	D. () () ()	exclusive.
BIOL3606	Diet and disease (6)	Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually exclusive.
BIOL3608	Food commodities (6)	Take either BIOL3608 or BIOL4208 to fulfill
	、 ,	this 24 credits requirement, but not both. BIOL3608 and BIOL4208 are mutually exclusive.
BIOL4201	Public health nutrition (6)	oxolucit el
BIOL4202	Nutrition and sports performance (6)	
BIOL4204	Diet, brain function and behavior (6)	
BIOL4205	Food technology (6)	[previous title: Food processing and
BIOL4207	Meat and dairy sciences (6)	engineering (6)] Take either BIOL4207 or BIOL4208 to fulfill this 24 credits requirement, but not both. BIOL4207 and BIOL4208 are mutually exclusive.
BIOL4208	Meat, dairy and grain sciences (6)	Take either BIOL3210 or BIOL4208; BIOL4207 or BIOL4208; BIOL3608 or BIOL4208 to fufill this 24 credits requirement, but not both. BIOL3210 and BIOL4208; BIOL4207 and BIOL4208; BIOL3608 and BIOL4208 are mutually exclusive.
BIOL4209	Functional foods (6)	,,
BIOL4210	Food product development (6)	
BIOL4411	Plant and food biotechnology (6)	
3. Capstone requi		
At least 6 credits	s selected from the following courses:	
BIOL3992	Directed studies in food & nutritional science (6)	
BIOL4912	Sensory evaluation of food (6)	
BIOL4913	Advanced practicum on food and nutrient analysis (6)	
BIOL4922	Food product development and evaluation (6)	
BIOL4962	Food & nutritional science internship (6)	
BIOL4992	Food & nutritional science project (12)	
BIOL4992	Food & nutritional science project (12)	

Notes:

- 1. BIOL4210 and BIOL4922 are mutually exclusive.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for
- 6. Students who wish to specialize in a certain area may choose to emphasize selection of courses from the following lists:
- (a) Food Science and Technology: BIOL3608; BIOL3207; BIOL3208 or BIOL3218; BIOL3209; BIOL3210 or BIOL4208; BIOL3216; BIOL4205; BIOL4207 or BIOL4208; BIOL4209; BIOL4210 or BIOL4922; BIOL4411; BIOL4913.
- (b) Nutrition and Health Science: BIOL3204; BIOL3205; BIOL3206; BIOL3207; BIOL3208 or BIOL3218; BIOL3211; BIOL3215; BIOL3217; BIOL3606; BIOL4201; BIOL4202.
- 7. Students who may wish to pursue postgraduate study in dietetics are strongly advised to consult their academic and course selection advisors regarding additional courses in Physiology and Biochemistry.

Offered to students 2020

admitted to Year 1 in

Objectives:

Geology concerns with the scientific study of the Earth's structure, processes, material and history. Geologists apply knowledge of chemistry, biology, physics and mathematics to solve Earth problems. The Geology Major aims to give students a sound foundation of the geological sciences and enable them to pursue postgraduate studies or careers in the geosciences. The curriculum emphasizes the development of knowledge and skills, and practical experience in the field. The core courses are designed to give students a well-rounded understanding of the geological disciplines including petrology, paleontology, geophysics, geochemistry, geochronology and the applications of geological knowledge to resource development, natural hazard management, and geotechnical and environmental engineering. Students who wish to become a professional geologist may take additional designated courses designed to meet the pathway for accreditation as a chartered geologist.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
- PLO 2: have acquired the ability to make observation, description, measurement and analysis of common geological features in the field, conduct geological mapping as well as undertake independent geological study, and appraise the related ethical issues (by means of both local and overseas residential field learning experience)
- PLO 3: communicate scientific concepts and critically discuss aspects of contemporary issues pertaining to earth sciences, environments and resources (by means of capstone, project-based learning and presentation opportunities in the curriculum)
- PLO 4: have gained some insight to the real-life industrial environment and developed connections within the geosciences profession (by means of internship opportunities in the curriculum)
- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Major in Geology (Intensive)

Minor in Earth Sciences

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field and laboratory methods (6)

EASC2406 Geochemistry (6) EASC2407 Mineralogy (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (36 credits)

EASC3402 Petrology (6)

EASC3403 Sedimentary environments (6) EASC3404 Structural geology (6) EASC3408 Geophysics (6)

EASC3409 Igneous and metamorphic petrogenesis (6)
EASC4406 Earth dynamics & global tectonics (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: EASC3406 Reconstruction of past climate (6)

EASC3410 Hydrogeology (6)
EASC3412 Earth resources (6)
EASC3413 Engineering geology (6)
EASC3414 Soil and rock mechanics (6)

EASC3416 Advanced geochemistry and geochronology (6)

EASC3417 Earth through time (6)

EASC3999 Directed studies in earth sciences (6)
ENVS3007 Natural hazards and mitigation (6)
EASC4403 Biogeochemical cycles (6)
EASC4407 Regional geology (6)

EASC4408 Special topics in earth sciences (6) EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second

major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Offered to students 2019

admitted to Year 1 in

Objectives:

Geology concerns with the scientific study of the Earth's structure, processes, material and history. Geologists apply knowledge of chemistry, biology, physics and mathematics to solve Earth problems. The Geology Major aims to give students a sound foundation of the geological sciences and enable them to pursue postgraduate studies or careers in the geosciences. The curriculum emphasizes the development of knowledge and skills, and practical experience in the field. The core courses are designed to give students a well-rounded understanding of the geological disciplines including petrology, paleontology, geophysics, geochemistry, geochronology and the applications of geological knowledge to resource development, natural hazard management, and geotechnical and environmental engineering. Students who wish to become a professional geologist may take additional designated courses designed to meet the pathway for accreditation as a chartered geologist.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
- PLO 2: have acquired the ability to make observation, description, measurement and analysis of common geological features in the field, conduct geological mapping as well as undertake independent geological study, and appraise the related ethical issues (by means of both local and overseas residential field learning experience)
- PLO 3: communicate scientific concepts and critically discuss aspects of contemporary issues pertaining to earth sciences, environments and resources (by means of capstone, project-based learning and presentation opportunities in the curriculum)
- PLO 4: have gained some insight to the real-life industrial environment and developed connections within the geosciences profession (by means of internship opportunities in the curriculum)
- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Major in Geology (Intensive)

Minor in Earth Sciences

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field and laboratory methods (6)

EASC2406 Geochemistry (6) EASC2407 Mineralogy (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (36 credits)

EASC3402 Petrology (6)

EASC3403 Sedimentary environments (6) EASC3404 Structural geology (6) EASC3408 Geophysics (6)

EASC3409 Igneous and metamorphic petrogenesis (6)
EASC4406 Earth dynamics & global tectonics (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: EASC3406 Reconstruction of past climate (6)

EASC3410 Hydrogeology (6)
EASC3412 Earth resources (6)
EASC3413 Engineering geology (6)
EASC3414 Soil and rock mechanics (6)

EASC3416 Advanced geochemistry and geochronology (6)

EASC3417 Earth through time (6)

EASC3999 Directed studies in earth sciences (6)
ENVS3007 Natural hazards and mitigation (6)
EASC4403 Biogeochemical cycles (6)
EASC4407 Regional geology (6)

EASC4408 Special topics in earth sciences (6) EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second

major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Offered to students 2018

admitted to Year 1 in

Objectives:

Geology concerns with the scientific study of the Earth's structure, processes, material and history. Geologists apply knowledge of chemistry, biology, physics and mathematics to solve Earth problems. The Geology Major aims to give students a sound foundation of the geological sciences and enable them to pursue postgraduate studies or careers in the geosciences. The curriculum emphasizes the development of knowledge and skills, and practical experience in the field. The core courses are designed to give students a well-rounded understanding of the geological disciplines including petrology, paleontology, geophysics, geochemistry, geochronology and the applications of geological knowledge to resource development, natural hazard management, and geotechnical and environmental engineering. Students who wish to become a professional geologist may take additional designated courses designed to meet the pathway for accreditation as a chartered geologist.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
- PLO 2: have acquired the ability to make observation, description, measurement and analysis of common geological features in the field, conduct geological mapping as well as undertake independent geological study, and appraise the related ethical issues (by means of both local and overseas residential field learning experience)
- PLO 3: communicate scientific concepts and critically discuss aspects of contemporary issues pertaining to earth sciences, environments and resources (by means of capstone, project-based learning and presentation opportunities in the curriculum)
- PLO 4: have gained some insight to the real-life industrial environment and developed connections within the geosciences profession (by means of internship opportunities in the curriculum)
- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Major in Geology (Intensive)

Minor in Earth Sciences

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field and laboratory methods (6)

EASC2406 Geochemistry (6) EASC2407 Mineralogy (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (36 credits)

EASC3402 Petrology (6)

EASC3403 Sedimentary environments (6) EASC3404 Structural geology (6) EASC3408 Geophysics (6)

EASC3409 Igneous and metamorphic petrogenesis (6)
EASC4406 Earth dynamics & global tectonics (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: EASC3406 Reconstruction of past climate (6)

EASC3410 Hydrogeology (6)
EASC3412 Earth resources (6)
EASC3413 Engineering geology (6)
EASC3414 Soil and rock mechanics (6)

EASC3416 Advanced geochemistry and geochronology (6)

EASC3417 Earth through time (6)

EASC3999 Directed studies in earth sciences (6)
ENVS3007 Natural hazards and mitigation (6)
EASC4403 Biogeochemical cycles (6)
EASC4407 Regional geology (6)

EASC4408 Special topics in earth sciences (6) EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second

major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Offered to students 2017

admitted to Year 1 in

Objectives:

Geology concerns with the scientific study of the Earth's structure, processes, material and history. Geologists apply knowledge of chemistry, biology, physics and mathematics to solve Earth problems. The Geology Major aims to give students a sound foundation of the geological sciences and enable them to pursue postgraduate studies or careers in the geosciences. The curriculum emphasizes the development of knowledge and skills, and practical experience in the field. The core courses are designed to give students a well-rounded understanding of the geological disciplines including petrology, paleontology, geophysics, geochemistry, geochronology and the applications of geological knowledge to resource development, natural hazard management, and geotechnical and environmental engineering. Students who wish to become a professional geologist may take additional designated courses designed to meet the pathway for accreditation as a chartered geologist.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
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- PLO 4: have gained some insight to the real-life industrial environment and developed connections within the geosciences profession (by means of internship opportunities in the curriculum)
- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Major in Geology (Intensive)

Minor in Earth Sciences

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

Scientific method and reasoning (6) SCNC1111 Fundamentals of modern science (6) SCNC1112

Disciplinary Core Courses (30 credits)

Principles of geology (6) EASC1402

Fluid/solid interactions in earth processes (6) EASC2401

EASC2402 Field and laboratory methods (6)

Geochemistry (6) FASC2406 Mineralogy (6) EASC2407

2. Advanced level courses (48 credits)

Disciplinary Core Courses (36 credits)

EASC3402 Petrology (6)

Sedimentary environments (6) EASC3403 EASC3404 Structural geology (6) Geophysics (6) FASC3408

Igneous and metamorphic petrogenesis (6) EASC3409 Earth dynamics & global tectonics (6) EASC4406

Disciplinary Electives (12 credits)

EASC3414

At least 12 credits selected from the following courses: Reconstruction of past climate (6) EASC3406

Hydrogeology (6) EASC3410 Earth resources (6) EASC3412 Engineering geology (6) EASC3413

Soil and rock mechanics (6) EASC3416 Advanced geochemistry and geochronology (6)

Earth through time (6) EASC3417

EASC3999 Directed studies in earth sciences (6) Natural hazards and mitigation (6) ENVS3007 **EASC4403** Biogeochemical cycles (6) Regional geology (6) EASC4407

Special topics in earth sciences (6) EASC4408 Earth sciences project (12) **EASC4999**

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6)

Notes:

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major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Offered to students 2016

admitted to Year 1 in

Objectives:

Geology concerns with the scientific study of the Earth's structure, processes, material and history. Geologists apply knowledge of chemistry, biology, physics and mathematics to solve Earth problems. The Geology Major aims to give students a sound foundation of the geological sciences and enable them to pursue postgraduate studies or careers in the geosciences. The curriculum emphasizes the development of knowledge and skills, and practical experience in the field. The core courses are designed to give students a well-rounded understanding of the geological disciplines including petrology, paleontology, geophysics, geochemistry, geochronology and the applications of geological knowledge to resource development, natural hazard management, and geotechnical and environmental engineering. Students who wish to become a professional geologist may take additional designated courses designed to meet the pathway for accreditation as a chartered geologist.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
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- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Major in Geology (Intensive)

Minor in Earth Sciences

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field and laboratory methods (6)

EASC2406 Geochemistry (6) EASC2407 Mineralogy (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (36 credits)

EASC3402 Petrology (6)

EASC3403 Sedimentary environments (6) EASC3404 Structural geology (6) EASC3408 Geophysics (6)

EASC3409 Igneous and metamorphic petrogenesis (6)
EASC4406 Earth dynamics & global tectonics (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: EASC3406 Reconstruction of past climate (6)

EASC3410 Hydrogeology (6)
EASC3412 Earth resources (6)
EASC3413 Engineering geology (6)
EASC3414 Soil and rock mechanics (6)

EASC3416 Advanced geochemistry and geochronology (6)

EASC3417 Earth through time (6)

EASC3999 Directed studies in earth sciences (6)
ENVS3007 Natural hazards and mitigation (6)
EASC4403 Biogeochemical cycles (6)
EASC4407 Regional geology (6)

EASC4408 Special topics in earth sciences (6) EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second

major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Offered to students 2015

admitted to Year 1 in

Objectives:

Geology concerns with the scientific study of the Earth's structure, processes, material and history. Geologists apply knowledge of chemistry, biology, physics and mathematics to solve Earth problems. The Geology Major aims to give students a sound foundation of the geological sciences and enable them to pursue postgraduate studies or careers in the geosciences. The curriculum emphasizes the development of knowledge and skills, and practical experience in the field. The core courses are designed to give students a well-rounded understanding of the geological disciplines including petrology, paleontology, geophysics, geochemistry, geochronology and the applications of geological knowledge to resource development, natural hazard management, and geotechnical and environmental engineering. Students who wish to become a professional geologist may take additional designated courses designed to meet the pathway for accreditation as a chartered geologist.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
- PLO 2: have acquired the ability to make observation, description, measurement and analysis of common geological features in the field, conduct geological mapping as well as undertake independent geological study, and appraise the related ethical issues (by means of both local and overseas residential field learning experience)
- PLO 3: communicate scientific concepts and critically discuss aspects of contemporary issues pertaining to earth sciences, environments and resources (by means of capstone, project-based learning and presentation opportunities in the curriculum)
- PLO 4: have gained some insight to the real-life industrial environment and developed connections within the geosciences profession (by means of internship opportunities in the curriculum)
- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Major in Geology (Intensive)

Minor in Earth Sciences

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field and laboratory methods (6)

EASC2406 Geochemistry (6) EASC2407 Mineralogy (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (36 credits)

EASC3402 Petrology (6)

EASC3403 Sedimentary environments (6) EASC3404 Structural geology (6) EASC3408 Geophysics (6)

EASC3409 Igneous and metamorphic petrogenesis (6)
EASC4406 Earth dynamics & global tectonics (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: EASC3406 Reconstruction of past climate (6)

EASC3410 Hydrogeology (6)
EASC3412 Earth resources (6)
EASC3413 Engineering geology (6)
EASC3414 Soil and rock mechanics (6)

EASC3416 Advanced geochemistry and geochronology (6)

EASC3417 Earth through time (6)

EASC3999 Directed studies in earth sciences (6)
ENVS3007 Natural hazards and mitigation (6)
EASC4403 Biogeochemical cycles (6)
EASC4407 Regional geology (6)

EASC4408 Special topics in earth sciences (6) EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second

major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Offered to students 2014

admitted to Year 1 in

Objectives:

Geology concerns with the scientific study of the Earth's structure, processes, material and history. Geologists apply knowledge of chemistry, biology, physics and mathematics to solve Earth problems. The Geology Major aims to give students a sound foundation of the geological sciences and enable them to pursue postgraduate studies or careers in the geosciences. The curriculum emphasizes the development of knowledge and skills, and practical experience in the field. The core courses are designed to give students a well-rounded understanding of the geological disciplines including petrology, paleontology, geophysics, geochemistry, geochronology and the applications of geological knowledge to resource development, natural hazard management, and geotechnical and environmental engineering. Students who wish to become a professional geologist may take additional designated courses designed to meet the pathway for accreditation as a chartered geologist.

Learning Outcomes:

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- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
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- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Minor in Earth Sciences

Required courses (96 credits) 1. Introductory level courses (42 credits) Disciplinary Core Courses: Science Foundation Courses (12 credits) SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6) **Disciplinary Core Courses (30 credits)** Principles of geology (6) EASC1402 Fluid/solid interactions in earth processes (6) EASC2401 Field and laboratory methods (6) EASC2402 EASC2406 Geochemistry (6) Mineralogy (6) EASC2407 2. Advanced level courses (48 credits)

Disciplinary Core Courses (48 credits)

EASC3402 Petrology (6)

EASC3403 Sedimentary environments (6)
EASC3404 Structural geology (6)
EASC3408 Geophysics (6)

EASC3409 Igneous and metamorphic petrogenesis (6)
EASC4406 Earth dynamics & global tectonics (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

EASC3406 Reconstruction of past climate (6)

EASC3410 Hydrogeology (6)

EASC3410 Hydrogeology (6)
EASC3412 Earth resources (6)
EASC3413 Engineering geology (6)
EASC3414 Soil and rock mechanics (6)

EASC3416 Advanced geochemistry and geochronology (6)

EASC3417 Earth through time (6)

EASC3999 Directed studies in earth sciences (6)
ENVS3007 Natural hazards and mitigation (6)
EASC4403 Biogeochemical cycles (6)
EASC4407 Regional geology (6)

EASC4408 Special topics in earth sciences (6) EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112

Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

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- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Offered to students 2013

admitted to Year 1 in

Objectives:

Geology concerns with the scientific study of the Earth's structure, processes, material and history. Geologists apply knowledge of chemistry, biology, physics and mathematics to solve Earth problems. The Geology Major aims to give students a sound foundation of the geological sciences and enable them to pursue postgraduate studies or careers in the geosciences. The curriculum emphasizes the development of knowledge and skills, and practical experience in the field. The core courses are designed to give students a well-rounded understanding of the geological disciplines including petrology, paleontology, geophysics, geochemistry, geochronology and the applications of geological knowledge to resource development, natural hazard management, and geotechnical and environmental engineering. Students who wish to become a professional geologist may take additional designated courses designed to meet the pathway for accreditation as a chartered geologist.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
- PLO 2: have acquired the ability to make observation, description, measurement and analysis of common geological features in the field, conduct geological mapping as well as undertake independent geological study, and appraise the related ethical issues (by means of both local and overseas residential field learning experience)
- PLO 3: communicate scientific concepts and critically discuss aspects of contemporary issues pertaining to earth sciences, environments and resources (by means of capstone, project-based learning and presentation opportunities in the curriculum)
- PLO 4: have gained some insight to the real-life industrial environment and developed connections within the geosciences profession (by means of internship opportunities in the curriculum)
- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Minor in Earth Sciences

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field and laboratory methods (6)

EASC2406 Geochemistry (6) EASC2407 Mineralogy (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (36 credits)

EASC3402 Petrology (6)

EASC3403 Sedimentary environments (6)
EASC3404 Structural geology (6)
EASC3408 Geophysics (6)

EASC3409 Igneous and metamorphic petrogenesis (6)
EASC4406 Earth dynamics & global tectonics (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

EASC3406 Reconstruction of past climate (6)
EASC3410 Hydrogeology (6)
EASC3412 Earth resources (6)
EASC3413 Engineering geology (6)
EASC3414 Soil and rock mechanics (6)

EASC3416 Advanced geochemistry and geochronology (6)

EASC3417 Earth through time (6)

EASC3999 Directed studies in earth sciences (6)
ENVS3007 Natural hazards and mitigation (6)
EASC4403 Biogeochemical cycles (6)
EASC4407 Regional geology (6)

EASC4408 Special topics in earth sciences (6)
EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112

Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Offered to students 2012

admitted to Year 1 in

Objectives:

Geology concerns with the scientific study of the Earth's structure, processes, material and history. Geologists apply knowledge of chemistry, biology, physics and mathematics to solve Earth problems. The Geology Major aims to give students a sound foundation of the geological sciences and enable them to pursue postgraduate studies or careers in the geosciences. The curriculum emphasizes the development of knowledge and skills, and practical experience in the field. The core courses are designed to give students a well-rounded understanding of the geological disciplines including petrology, paleontology, geophysics, geochemistry, geochronology and the applications of geological knowledge to resource development, natural hazard management, and geotechnical and environmental engineering. Students who wish to become a professional geologist may take additional designated courses designed to meet the pathway for accreditation as a chartered geologist.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
- PLO 2: have acquired the ability to make observation, description, measurement and analysis of common geological features in the field, conduct geological mapping as well as undertake independent geological study, and appraise the related ethical issues (by means of both local and overseas residential field learning experience)
- PLO 3: communicate scientific concepts and critically discuss aspects of contemporary issues pertaining to earth sciences, environments and resources (by means of capstone, project-based learning and presentation opportunities in the curriculum)
- PLO 4: have gained some insight to the real-life industrial environment and developed connections within the geosciences profession (by means of internship opportunities in the curriculum)
- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Minor in Earth Sciences

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field and laboratory methods (6)

EASC2406 Geochemistry (6) EASC2407 Mineralogy (6)

2. Advanced level courses (48 credits) Disciplinary Core Courses (36 credits)

Disciplinary Core Courses (36 Credit

EASC3402 Petrology (6)

EASC3403 Sedimentary environments (6)
EASC3404 Structural geology (6)
EASC3408 Geophysics (6)

EASC3409 Igneous and metamorphic petrogenesis (6)
EASC4406 Earth dynamics & global tectonics (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

EASC3406 Reconstruction of past climate (6)
EASC3410 Hydrogeology (6)
EASC3412 Earth resources (6)
EASC3413 Engineering geology (6)
EASC3414 Soil and rock mechanics (6)

EASC3416 Advanced geochemistry and geochronology (6)

EASC3417 Earth through time (6)

EASC3999 Directed studies in earth sciences (6)
ENVS3007 Natural hazards and mitigation (6)
EASC4403 Biogeochemical cycles (6)
EASC4407 Regional geology (6)

EASC4408 Special topics in earth sciences (6)
EASC4999 Earth sciences project (12)

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112

Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title	Major in Geology (Intensive)	
Maior Tille	Major III Geology (IIIIelisive)	

Offered to students 2020

admitted to Year 1 in

Objectives:

To provide an education in Geology which meets the current minimum requirements of the Geological Society of London for accreditation.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
- PLO 2: have acquired the ability to make observation, description, measurement and analysis of common geological features in the field, conduct geological mapping as well as undertake independent geological study, and appraise the related ethical issues (by means of both local and overseas residential field learning experience)
- PLO 3: communicate scientific concepts and critically discuss aspects of contemporary issues pertaining to earth sciences, environments and resources (by means of capstone, project-based learning and presentation opportunities in the curriculum)
- PLO 4: have gained some insight to the real-life industrial environment and developed connections within the geosciences profession (by means of internship opportunities in the curriculum)
- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Major in Geology

Minor in Earth Sciences

EASC4966 Earth sciences internship (6)

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6)

(Note 1)

Notes:

- 1. These are core courses in the regular Geology Major (96 credits) curriculum.
- 2. Requires approval to qualify for accredited pathway. EASC4999 Earth sciences project must have a significant 3D geological evolutionary component to meet Accredited Pathway requirements, as specified during our 2016 re-accreditation. Therefore, each EASC4999 project intended to qualify for the Accredited Pathway must be approved by the Geology major coordinator as satisfying this requirement. This policy is effective for all projects starting in 2017 and after.
- 3. In the list of disciplinary elective courses, two of them are introductory level courses while the others are advanced level courses. If students take all advanced level courses in the list, the total number of introductory level courses is 54 credits while that of advanced level courses is 90 credits. If students take 2 introductory level courses in the list and 3 advanced level courses, the total number of introductory level courses is 66 credits and that of advanced level courses is 78 credits.
- 4. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks

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Maior Title	Maior in Geology (Intensive)	١
IVIAIOI TILI U	Maior in Geology (Intensive	,

Offered to students 2019

admitted to Year 1 in

Objectives:

To provide an education in Geology which meets the current minimum requirements of the Geological Society of London for accreditation.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
- PLO 2: have acquired the ability to make observation, description, measurement and analysis of common geological features in the field, conduct geological mapping as well as undertake independent geological study, and appraise the related ethical issues (by means of both local and overseas residential field learning experience)
- PLO 3: communicate scientific concepts and critically discuss aspects of contemporary issues pertaining to earth sciences, environments and resources (by means of capstone, project-based learning and presentation opportunities in the curriculum)
- PLO 4: have gained some insight to the real-life industrial environment and developed connections within the geosciences profession (by means of internship opportunities in the curriculum)
- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Major in Geology

Required courses (150	credits)	
-	irses (54 to 66 credits) (Note 1)	
	es: Science Foundation Courses (12 credits)	
SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core Cours	es (42 credits)	, ,
EASC1401	Blue Planet (6)	
EASC1402	Principles of geology (6)	(Note 1)
EASC2401	Fluid/solid interactions in earth processes (6)	(Note 1)
EASC2402	Field and laboratory methods (6)	(Note 1)
EASC2406	Geochemistry (6)	(Note 1)
EASC2407	Mineralogy (6)	(Note 1)
EASC2409	Regional field studies (6)	,
	es (78 to 90 credits) (Note 1)	
Disciplinary Core Cours		
EASC3402	Petrology (6)	(Note 1)
EASC3403	Sedimentary environments (6)	(Note 1)
EASC3404	Structural geology (6)	(Note 1)
EASC3408	Geophysics (6)	(Note 1)
EASC3409	Igneous and metamorphic petrogenesis (6)	(Note 1)
EASC3417	Earth through time (6)	(Note 1)
EASC4406	Earth dynamics & global tectonics (6)	(Note 1)
EASC4400	Regional geology (6)	(Note 1)
	Earth sciences project (12)	(Note 2)
EASC4999	. , , ,	(11016.2)
Disciplinary Electives (3		t A and List D. smanns whi
	cted from the following introductory and advanced level courses in Lis	t A and List B, among whic
at least 6 credits from I	LIST A:	
List A	Finding mantal remate consinu (C)	
EASC3405	Environmental remote sensing (6)	
EASC3413	Engineering geology (6)	
List B		
EASC2404	Introduction to atmosphere and hydrosphere (6)	
EASC2408	Planetary geology (6)	
EASC3020	Global change: anthropogenic impacts (6)	
EASC3406	Reconstruction of past climate (6)	
EASC3410	Hydrogeology (6)	
EASC3412	Earth resources (6)	
EASC3414	Soil and rock mechanics (6)	
EASC3416	Advanced geochemistry and geochronology (6)	
EASC3999	Directed studies in earth sciences (6)	
ENVS3007	Natural hazards and mitigation (6)	
ENVS3313	Environmental oceanography (6)	
EASC4403	Biogeochemical cycles (6)	
EASC4408	Special topics in earth sciences (6)	
EASC4911	Earth system: contemporary issues (6)	

EASC4966 Earth sciences internship (6)

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6) (Note 1)

Notes:

- 1. These are core courses in the regular Geology Major (96 credits) curriculum.
- 2. Requires approval to qualify for accredited pathway. EASC4999 Earth sciences project must have a significant 3D geological evolutionary component to meet Accredited Pathway requirements, as specified during our 2016 re-accreditation. Therefore, each EASC4999 project intended to qualify for the Accredited Pathway must be approved by the Geology major coordinator as satisfying this requirement. This policy is effective for all projects starting in 2017 and after.
- 3. In the list of disciplinary elective courses, two of them are introductory level courses while the others are advanced level courses. If students take all advanced level courses in the list, the total number of introductory level courses is 54 credits while that of advanced level courses is 90 credits. If students take 2 introductory level courses in the list and 3 advanced level courses, the total number of introductory level courses is 66 credits and that of advanced level courses is 78 credits.

Remarks:

Major Title	Major in Geology (Intensive)	
Maior Tille	Major III Geology (IIIIelisive)	

Offered to students 2018

admitted to Year 1 in

Objectives:

To provide an education in Geology which meets the current minimum requirements of the Geological Society of London for accreditation.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
- PLO 2: have acquired the ability to make observation, description, measurement and analysis of common geological features in the field, conduct geological mapping as well as undertake independent geological study, and appraise the related ethical issues (by means of both local and overseas residential field learning experience)
- PLO 3: communicate scientific concepts and critically discuss aspects of contemporary issues pertaining to earth sciences, environments and resources (by means of capstone, project-based learning and presentation opportunities in the curriculum)
- PLO 4: have gained some insight to the real-life industrial environment and developed connections within the geosciences profession (by means of internship opportunities in the curriculum)
- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Major in Geology

Doguired courses (450	aradita\	
Required courses (150		
	irses (54 to 66 credits) (Note 1)	
	es: Science Foundation Courses (12 credits)	(1)
SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core Cours		
EASC1401	Blue Planet (6)	(1)
EASC1402	Principles of geology (6)	(Note 1)
EASC2401	Fluid/solid interactions in earth processes (6)	(Note 1)
EASC2402	Field and laboratory methods (6)	(Note 1)
EASC2406	Geochemistry (6)	(Note 1)
EASC2407	Mineralogy (6)	(Note 1)
EASC2409	Regional field studies (6)	
	es (78 to 90 credits) (Note 1)	
Disciplinary Core Cours	· ·	
EASC3402	Petrology (6)	(Note 1)
EASC3403	Sedimentary environments (6)	(Note 1)
EASC3404	Structural geology (6)	(Note 1)
EASC3408	Geophysics (6)	(Note 1)
EASC3409	Igneous and metamorphic petrogenesis (6)	(Note 1)
EASC3417	Earth through time (6)	
EASC4406	Earth dynamics & global tectonics (6)	(Note 1)
EASC4407	Regional geology (6)	
EASC4999	Earth sciences project (12)	(Note 2)
Disciplinary Electives (3		
	cted from the following introductory and advanced level courses in Li	st A and List B, among whic
at least 6 credits from l	List A:	
List A		
EASC3405	Environmental remote sensing (6)	
EASC3413	Engineering geology (6)	
List B		
EASC2404	Introduction to atmosphere and hydrosphere (6)	
EASC2408	Planetary geology (6)	
EASC3020	Global change: anthropogenic impacts (6)	
EASC3406	Reconstruction of past climate (6)	
EASC3410	Hydrogeology (6)	
EASC3412	Earth resources (6)	
EASC3414	Soil and rock mechanics (6)	
EASC3416	Advanced geochemistry and geochronology (6)	
EASC3999	Directed studies in earth sciences (6)	
ENVS3007	Natural hazards and mitigation (6)	
ENVS3313	Environmental oceanography (6)	
EASC4403	Biogeochemical cycles (6)	
EACC4400	Special topics in earth sciences (6)	
EASC4408	oposiai topise in caran esienese (e)	

EASC4966 Earth sciences internship (6)

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6) (Note 1)

Notes:

- 1. These are core courses in the regular Geology Major (96 credits) curriculum.
- 2. Requires approval to qualify for accredited pathway. EASC4999 Earth sciences project must have a significant 3D geological evolutionary component to meet Accredited Pathway requirements, as specified during our 2016 re-accreditation. Therefore, each EASC4999 project intended to qualify for the Accredited Pathway must be approved by the Geology major coordinator as satisfying this requirement. This policy is effective for all projects starting in 2017 and after.
- 3. In the list of disciplinary elective courses, two of them are introductory level courses while the others are advanced level courses. If students take all advanced level courses in the list, the total number of introductory level courses is 54 credits while that of advanced level courses is 90 credits. If students take 2 introductory level courses in the list and 3 advanced level courses, the total number of introductory level courses is 66 credits and that of advanced level courses is 78 credits.

Remarks:

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Maior Title	Maior in Geology (Intensive)	١
IVIAIOI TILI U	Maior in Geology (Intensive	,

Offered to students 2017

admitted to Year 1 in

Objectives:

To provide an education in Geology which meets the current minimum requirements of the Geological Society of London for accreditation.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
- PLO 2: have acquired the ability to make observation, description, measurement and analysis of common geological features in the field, conduct geological mapping as well as undertake independent geological study, and appraise the related ethical issues (by means of both local and overseas residential field learning experience)
- PLO 3: communicate scientific concepts and critically discuss aspects of contemporary issues pertaining to earth sciences, environments and resources (by means of capstone, project-based learning and presentation opportunities in the curriculum)
- PLO 4: have gained some insight to the real-life industrial environment and developed connections within the geosciences profession (by means of internship opportunities in the curriculum)
- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Major in Geology

Required courses (150	crodite)	
-	•	
	rrses (54 to 66 credits) (Note 1)	
	es: Science Foundation Courses (12 credits)	(Nata 4)
SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core Cours		
EASC1401	Blue Planet (6)	(1)
EASC1402	Principles of geology (6)	(Note 1)
EASC2401	Fluid/solid interactions in earth processes (6)	(Note 1)
EASC2402	Field and laboratory methods (6)	(Note 1)
EASC2406	Geochemistry (6)	(Note 1)
EASC2407	Mineralogy (6)	(Note 1)
EASC2409	Regional field studies (6)	
	es (78 to 90 credits) (Note 1)	
Disciplinary Core Cours		
EASC3402	Petrology (6)	(Note 1)
EASC3403	Sedimentary environments (6)	(Note 1)
EASC3404	Structural geology (6)	(Note 1)
EASC3408	Geophysics (6)	(Note 1)
EASC3409	Igneous and metamorphic petrogenesis (6)	(Note 1)
EASC3417	Earth through time (6)	
EASC4406	Earth dynamics & global tectonics (6)	(Note 1)
EASC4407	Regional geology (6)	
EASC4999	Earth sciences project (12)	(Note 2)
Disciplinary Electives (3		
At least 30 credits sele	cted from the following introductory and advanced level courses in L	ist A and List B, among whic
at least 6 credits from I	List A:	
List A		
EASC3405	Environmental remote sensing (6)	
EASC3413	Engineering geology (6)	
List B		
EASC2404	Introduction to atmosphere and hydrosphere (6)	
EASC2408	Planetary geology (6)	
EASC3020	Global change: anthropogenic impacts (6)	
EASC3406	Reconstruction of past climate (6)	
EASC3410	Hydrogeology (6)	
EASC3412	Earth resources (6)	
EASC3414	Soil and rock mechanics (6)	
EASC3416	Advanced geochemistry and geochronology (6)	
EASC3999	Directed studies in earth sciences (6)	
ENVS3007	Natural hazards and mitigation (6)	
ENVS3313	Environmental oceanography (6)	
EASC4403	Biogeochemical cycles (6)	
EASC4408	Special topics in earth sciences (6)	
EASC4911	Earth system: contemporary issues (6)	

EASC4966 Earth sciences internship (6)

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6) (Note 1)

Notes:

- 1. These are core courses in the regular Geology Major (96 credits) curriculum.
- 2. Requires approval to qualify for accredited pathway. EASC4999 Earth sciences project must have a significant 3D geological evolutionary component to meet Accredited Pathway requirements, as specified during our 2016 re-accreditation. Therefore, each EASC4999 project intended to qualify for the Accredited Pathway must be approved by the Geology major coordinator as satisfying this requirement. This policy is effective for all projects starting in 2017 and after.
- 3. In the list of disciplinary elective courses, two of them are introductory level courses while the others are advanced level courses. If students take all advanced level courses in the list, the total number of introductory level courses is 54 credits while that of advanced level courses is 90 credits. If students take 2 introductory level courses in the list and 3 advanced level courses, the total number of introductory level courses is 66 credits and that of advanced level courses is 78 credits.

Remarks:

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Maior Title	Maior in Geology (Intensive)	١
IVIAIOI TILI U	Maior in Geology (Intensive	,

Offered to students 2016

admitted to Year 1 in

Objectives:

To provide an education in Geology which meets the current minimum requirements of the Geological Society of London for accreditation.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
- PLO 2: have acquired the ability to make observation, description, measurement and analysis of common geological features in the field, conduct geological mapping as well as undertake independent geological study, and appraise the related ethical issues (by means of both local and overseas residential field learning experience)
- PLO 3: communicate scientific concepts and critically discuss aspects of contemporary issues pertaining to earth sciences, environments and resources (by means of capstone, project-based learning and presentation opportunities in the curriculum)
- PLO 4: have gained some insight to the real-life industrial environment and developed connections within the geosciences profession (by means of internship opportunities in the curriculum)
- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Major in Geology

Minor in Earth Sciences

nor in Earth Sciences		
Required courses (150 c	redits)	
i. Introductory level cours	es (54 to 66 credits) (Note 1)	
Disciplinary Core Courses	: Science Foundation Courses (12 credits)	
SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core Courses	(42 credits)	
EASC1401	Blue Planet (6)	
EASC1402	Principles of geology (6)	(Note 1)
EASC2401	Fluid/solid interactions in earth processes (6)	(Note 1)
EASC2402	Field and laboratory methods (6)	(Note 1)
EASC2406	Geochemistry (6)	(Note 1)
EASC2407	Mineralogy (6)	(Note 1)
EASC2409	Regional field studies (6)	. ,
2. Advanced level courses	(78 to 90 credits) (Note 1)	
Disciplinary Core Courses		
EASC3402	Petrology (6)	(Note 1)
EASC3403	Sedimentary environments (6)	(Note 1)
EASC3404	Structural geology (6)	(Note 1)
EASC3408	Geophysics (6)	(Note 1)
EASC3409	Igneous and metamorphic petrogenesis (6)	(Note 1)
EASC3417	Earth through time (6)	,
EASC4406	Earth dynamics & global tectonics (6)	(Note 1)
EASC4407	Regional geology (6)	,
EASC4999	Earth sciences project (12)	(Note 2)
Disciplinary Electives (30	. , , ,	,
	ed from the following introductory and advanced level courses in Lis	st A and List B. among whic
at least 6 credits from Lis	,	or realized and arrived grammer
List A		
EASC3405	Environmental remote sensing (6)	
EASC3413	Engineering geology (6)	
List B	g gg) (+)	
EASC2404	Introduction to atmosphere and hydrosphere (6)	
EASC2408	Planetary geology (6)	
EASC3020	Global change: anthropogenic impacts (6)	
EASC3406	Reconstruction of past climate (6)	
EASC3410	Hydrogeology (6)	
EASC3412	Earth resources (6)	
EASC3414	Soil and rock mechanics (6)	
EASC3416	Advanced geochemistry and geochronology (6)	
EASC3999	Directed studies in earth sciences (6)	
ENVS3007	Natural hazards and mitigation (6)	
ENVS3313	Environmental oceanography (6)	
	Biogeochemical cycles (6)	
FASU44U3		
EASC4403 EASC4408	Special topics in earth sciences (6)	

EASC4966 Earth sciences internship (6)

3. Capstone requirement (6 credits)

EASC4955 Integrated field studies (6) (Note 1)

Notes:

- 1. These are core courses in the regular Geology Major (96 credits) curriculum.
- 2. Requires approval to qualify for accredited pathway. EASC4999 Earth sciences project must have a significant 3D geological evolutionary component to meet Accredited Pathway requirements, as specified during our 2016 re-accreditation. Therefore, each EASC4999 project intended to qualify for the Accredited Pathway must be approved by the Geology major coordinator as satisfying this requirement. This policy is effective for all projects starting in 2017 and after.
- 3. In the list of disciplinary elective courses, two of them are introductory level courses while the others are advanced level courses. If students take all advanced level courses in the list, the total number of introductory level courses is 54 credits while that of advanced level courses is 90 credits. If students take 2 introductory level courses in the list and 3 advanced level courses, the total number of introductory level courses is 66 credits and that of advanced level courses is 78 credits.

Remarks:

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Maior Title	Maior in Geology (Intensive)	١
IVIAIOI TILI U	Maior in Geology (Intensive	,

Offered to students 2015

admitted to Year 1 in

Objectives:

To provide an education in Geology which meets the current minimum requirements of the Geological Society of London for accreditation.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and apply key concepts in the conventional areas of the geosciences, covering the areas of physical geology, historical geology, mineralogy, petrology, geochemistry, geophysics, structural geology, tectonics and petrogenesis, and earth resources (by means of coursework, laboratory-based, tutorial classes and project-based learning in the curriculum)
- PLO 2: have acquired the ability to make observation, description, measurement and analysis of common geological features in the field, conduct geological mapping as well as undertake independent geological study, and appraise the related ethical issues (by means of both local and overseas residential field learning experience)
- PLO 3: communicate scientific concepts and critically discuss aspects of contemporary issues pertaining to earth sciences, environments and resources (by means of capstone, project-based learning and presentation opportunities in the curriculum)
- PLO 4: have gained some insight to the real-life industrial environment and developed connections within the geosciences profession (by means of internship opportunities in the curriculum)
- PLO 5: work with others in an effective manner and have learned to accept and appreciate different cultures (by means of group project learning, field learning experience in the curriculum)

Impermissible Combinations:

Major in Geology

Required courses (150	crodite)	
-	-	
	rrses (54 to 66 credits) (Note 1)	
	es: Science Foundation Courses (12 credits)	(Nata 4)
SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core Cours		
EASC1401	Blue Planet (6)	(Nata 4)
EASC1402	Principles of geology (6)	(Note 1)
EASC2401	Fluid/solid interactions in earth processes (6)	(Note 1)
EASC2402	Field and laboratory methods (6)	(Note 1)
EASC2406	Geochemistry (6)	(Note 1)
EASC2407	Mineralogy (6)	(Note 1)
EASC2409	Regional field studies (6)	
	es (78 to 90 credits) (Note 1)	
Disciplinary Core Cours		44
EASC3402	Petrology (6)	(Note 1)
EASC3403	Sedimentary environments (6)	(Note 1)
EASC3404	Structural geology (6)	(Note 1)
EASC3408	Geophysics (6)	(Note 1)
EASC3409	Igneous and metamorphic petrogenesis (6)	(Note 1)
EASC3417	Earth through time (6)	
EASC4406	Earth dynamics & global tectonics (6)	(Note 1)
EASC4407	Regional geology (6)	
EASC4999	Earth sciences project (12)	(Note 2)
Disciplinary Electives (3		
At least 30 credits sele	cted from the following introductory and advanced level courses in L	ist A and List B, among whic
at least 6 credits from I	List A:	
List A		
EASC3405	Environmental remote sensing (6)	
EASC3413	Engineering geology (6)	
List B		
EASC2404	Introduction to atmosphere and hydrosphere (6)	
EASC2408	Planetary geology (6)	
EASC3020	Global change: anthropogenic impacts (6)	
EASC3406	Reconstruction of past climate (6)	
EASC3410	Hydrogeology (6)	
EASC3412	Earth resources (6)	
EASC3414	Soil and rock mechanics (6)	
EASC3416	Advanced geochemistry and geochronology (6)	
EASC3999	Directed studies in earth sciences (6)	
ENVS3007	Natural hazards and mitigation (6)	
ENVS3313	Environmental oceanography (6)	
EASC4403	Biogeochemical cycles (6)	
EASC4408	Special topics in earth sciences (6)	
EASC4911	Earth system: contemporary issues (6)	

	EASC4966	Earth sciences internship (6)			
	3. Capstone requirement (6 credits)				
Ш	EASC4955	Integrated field studies (6)	(Note 1)		
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Notes:

- 1. These are core courses in the regular Geology Major (96 credits) curriculum.
- 2. Requires approval to qualify for accredited pathway. EASC4999 Earth sciences project must have a significant 3D geological evolutionary component to meet Accredited Pathway requirements, as specified during our 2016 re-accreditation. Therefore, each EASC4999 project intended to qualify for the Accredited Pathway must be approved by the Geology major coordinator as satisfying this requirement. This policy is effective for all projects starting in 2017 and after.
- 3. In the list of disciplinary elective courses, two of them are introductory level courses while the others are advanced level courses. If students take all advanced level courses in the list, the total number of introductory level courses is 54 credits while that of advanced level courses is 90 credits. If students take 2 introductory level courses in the list and 3 advanced level courses, the total number of introductory level courses is 66 credits and that of advanced level courses is 78 credits.

Remarks:

Major Title Major in Mathematics

Offered to students 2020

admitted to Year 1 in

Objectives:

The Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize fundamental knowledge and concepts in Mathematics and elective courses provide training in both pure and applied aspects of Mathematics. Throughout the curriculum there is also emphasis on experiential learning through guided studies, projects, seminars and summer internships. With the diversity of courses offered in the major, various specializations are available. These will lead to careers in a wide range of sectors including education, economics and finance, analytics and data science, logistics, management, research and further studies.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present fundamental concepts in mathematics (by means of coursework and learning activities in the major or minor curriculum)
- PLO 2: apply mathematical theory and techniques to different areas of Sciences, and appraise the related ethical issues (by means of coursework and learning activities in the major or minor curriculum)
- PLO 3: communicate in mathematical language and present scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics (Intensive)

Minor in Computational & Financial Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

MATH1013 University mathematics II (6)

MATH2012 Fundamental concepts of mathematics (6)

MATH2101 Linear algebra I (6)
MATH2102 Linear algebra II (6)
MATH2211 Multivariable calculus (6)

MATH2241 Introduction to mathematical analysis (6)

2. Advanced level courses (42 credits)

Disciplinary Core Course (6 credits)

MATH3401 Analysis I (6)

Disciplinary Electives (36 credits)

At least 36 credits advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), of which at least 12 credits are selected from List A and at least 12 credits should be from MATH4XXX or MATH7XXX level, subject to pre-requisite requirements. The current list includes courses in List A, List B and those courses not selected to fulfill the capstone requirements, but excluding MATH4966 Mathematics Internship.

List A

MATH3301 Algebra I (6)

MATH3403 Functions of a complex variable (6) MATH3601 Numerical analysis (6)

MATH 13004 Probability theory (6)

MATH3904 Introduction to optimization (6)

List B

MATH3001 Development of mathematical ideas (6)

MATH3001 Mathematics seminar (6)
MATH3002 Materia theory and its applications (6)
MATH3304 Introduction to number theory (6)

MATH3405 Differential equations (6)

MATH3408 Computational methods and differential equations with

applications (6)

MATH3541 Introduction to topology (6)
MATH3600 Discrete mathematics (6)
MATH3901 Operations research I (6)
MATH3905 Queueing theory and simulation (6)

MATH3906 Financial calculus (6)
MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6)

MATH4302 Algebra II (6)
MATH4402 Analysis II (6)
MATH4404 Functional analysis (6)

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l	MATH4406	Introduction to partial differential equations (6)		
П	MATH4501	Geometry (6)		
П	MATH4511	Introduction to differentiable manifolds (6)		
П	MATH4602	Scientific computing (6)		
П	MATH4902	Operations research II (6)		
П	MATH4907	Numerical methods for financial calculus (6)		
П	MATH7101	Intermediate complex analysis (6)		
П	MATH7201	Topics in geometry (6)		
П	MATH7202	Complex manifolds (6)		
П	MATH7217	Topics in financial mathematics (6)		
П	MATH7219	Topics in applied functional analysis (6)		
П	MATH7224	Topics in advanced probability theory (6)		
П	MATH7501	Topics in algebra (6)		
П	MATH7502	Topics in applied discrete mathematics (6)		
П	MATH7503	Topics in mathematical programming and optimization (6)		
П	MATH7504	Geometric topology (6)		
П	MATH7505	Real analysis (6)		
П	3. Capstone requirement (6 credits)			
П	At least 6 credits selected from the following courses:			
П	MATH3999	Directed studies in mathematics (6)		
П	MATH4910	Senior mathematics seminar (6)		
П	MATH4911	Mathematics capstone project (6)		
Ш	MATH4966	Mathematics internship (6)		
Ш	MATH4999	Mathematics project (12)		
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Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.
- 6. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Major Title Major in Mathematics

Offered to students 2019

admitted to Year 1 in

Objectives:

The Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize fundamental knowledge and concepts in Mathematics and elective courses provide training in both pure and applied aspects of Mathematics. Throughout the curriculum there is also emphasis on experiential learning through guided studies, projects, seminars and summer internships. With the diversity of courses offered in the major, various specializations are available. These will lead to careers in a wide range of sectors including education, economics and finance, analytics and data science, logistics, management, research and further studies.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present fundamental concepts in mathematics (by means of coursework and learning activities in the major or minor curriculum)
- PLO 2: apply mathematical theory and techniques to different areas of Sciences, and appraise the related ethical issues (by means of coursework and learning activities in the major or minor curriculum)
- PLO 3: communicate in mathematical language and present scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics (Intensive)

Minor in Computational & Financial Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) Scientific method and reasoning (6) SCNC1111 Fundamentals of modern science (6) **SCNC1112**

Disciplinary Core Courses (36 credits)

MATH1013 University mathematics II (6)

MATH2012 Fundamental concepts of mathematics (6)

MATH2101 Linear algebra I (6) Linear algebra II (6) MATH2102 Multivariable calculus (6) **MATH2211**

Introduction to mathematical analysis (6) MATH2241

2. Advanced level courses (42 credits)

Disciplinary Core Course (6 credits)

Analysis I (6) MATH3401

Disciplinary Electives (36 credits)

At least 36 credits advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), of which at least 12 credits are selected from List A and at least 12 credits should be from MATH4XXX or MATH7XXX level, subject to pre-requisite requirements. The current list includes courses in List A, List B and those courses not selected to fulfill the capstone requirements, but excluding MATH4966 Mathematics Internship.

I ist A

MATH3301 Algebra I (6)

Functions of a complex variable (6) MATH3403 MATH3601 Numerical analysis (6)

MATH3603 Probability theory (6) MATH3904 Introduction to optimization (6)

List B

Development of mathematical ideas (6)

MATH3001 MATH3002 Mathematics seminar (6) MATH3303 Matrix theory and its applications (6) MATH3304 Introduction to number theory (6)

Differential equations (6) MATH3405

Computational methods and differential equations with MATH3408

applications (6)

Introduction to topology (6) MATH3541 Discrete mathematics (6) MATH3600 MATH3901 Operations research I (6) MATH3905 Queueing theory and simulation (6) MATH3906 Financial calculus (6)

MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6)

MATH4302 Algebra II (6) MATH4402 Analysis II (6) Functional analysis (6) MATH4404

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l	MATH4406	Introduction to partial differential equations (6)	
ı	MATH4501	Geometry (6)	
ı	MATH4511	Introduction to differentiable manifolds (6)	
ı	MATH4602	Scientific computing (6)	
ı	MATH4902	Operations research II (6)	
ı	MATH4907	Numerical methods for financial calculus (6)	
ı	MATH7101	Intermediate complex analysis (6)	
ı	MATH7201	Topics in geometry (6)	
ı	MATH7202	Complex manifolds (6)	
ı	MATH7217	Topics in financial mathematics (6)	
ı	MATH7219	Topics in applied functional analysis (6)	
ı	MATH7224	Topics in advanced probability theory (6)	
ı	MATH7501	Topics in algebra (6)	
ı	MATH7502	Topics in applied discrete mathematics (6)	
ı	MATH7503	Topics in mathematical programming and optimization (6)	
ı	MATH7504	Geometric topology (6)	
ı	MATH7505	Real analysis (6)	
ı	3. Capstone requirement (G credits)	
ı	At least 6 credits selected	from the following courses:	
ı	MATH3999	Directed studies in mathematics (6)	
ı	MATH4910	Senior mathematics seminar (6)	
ı	MATH4911	Mathematics capstone project (6)	
ı	MATH4966	Mathematics internship (6)	
ı	MATH4999	Mathematics project (12)	
ı			

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Mathematics

Offered to students 2018

admitted to Year 1 in

Objectives:

The Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize fundamental knowledge and concepts in Mathematics and elective courses provide training in both pure and applied aspects of Mathematics. Throughout the curriculum there is also emphasis on experiential learning through guided studies, projects, seminars and summer internships. With the diversity of courses offered in the major, various specializations are available. These will lead to careers in a wide range of sectors including education, economics and finance, analytics and data science, logistics, management, research and further studies.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present fundamental concepts in mathematics (by means of coursework and learning activities in the major or minor curriculum)
- PLO 2: apply mathematical theory and techniques to different areas of Sciences, and appraise the related ethical issues (by means of coursework and learning activities in the major or minor curriculum)
- PLO 3: communicate in mathematical language and present scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics (Intensive)

Minor in Computational & Financial Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) Scientific method and reasoning (6) SCNC1111

Fundamentals of modern science (6) **SCNC1112**

Disciplinary Core Courses (36 credits)

MATH1013 University mathematics II (6)

MATH2012 Fundamental concepts of mathematics (6)

MATH2101 Linear algebra I (6) Linear algebra II (6) MATH2102 Multivariable calculus (6) **MATH2211**

Introduction to mathematical analysis (6) MATH2241

2. Advanced level courses (42 credits)

Disciplinary Core Course (6 credits)

Analysis I (6) MATH3401

Disciplinary Electives (36 credits)

At least 36 credits advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), of which at least 12 credits are selected from List A and at least 12 credits should be from MATH4XXX or MATH7XXX level, subject to pre-requisite requirements. The current list includes courses in List A, List B and those courses not selected to fulfill the capstone requirements, but excluding MATH4966 Mathematics Internship.

I ist A

MATH3301 Algebra I (6)

Functions of a complex variable (6) MATH3403 MATH3601 Numerical analysis (6)

MATH3603 Probability theory (6)

MATH3904 Introduction to optimization (6)

List B

MATH4404

MATH3001 Development of mathematical ideas (6)

MATH3002 Mathematics seminar (6) MATH3303 Matrix theory and its applications (6) MATH3304 Introduction to number theory (6)

Differential equations (6) MATH3405

Computational methods and differential equations with MATH3408

applications (6)

Introduction to topology (6) MATH3541 Discrete mathematics (6) MATH3600 MATH3901 Operations research I (6)

MATH3905 Queueing theory and simulation (6) MATH3906 Financial calculus (6)

MATH3911 Game theory and strategy (6) MATH3943 Network models in operations research (6)

MATH4302 Algebra II (6) MATH4402 Analysis II (6) Functional analysis (6)

l	MATH4406	Introduction to partial differential equations (6)	
П	MATH4501	Geometry (6)	
П	MATH4511	Introduction to differentiable manifolds (6)	
П	MATH4602	Scientific computing (6)	
П	MATH4902	Operations research II (6)	
П	MATH4907	Numerical methods for financial calculus (6)	
П	MATH7101	Intermediate complex analysis (6)	
П	MATH7201	Topics in geometry (6)	
П	MATH7202	Complex manifolds (6)	
П	MATH7217	Topics in financial mathematics (6)	
П	MATH7219	Topics in applied functional analysis (6)	
П	MATH7224	Topics in advanced probability theory (6)	
П	MATH7501	Topics in algebra (6)	
П	MATH7502	Topics in applied discrete mathematics (6)	
П	MATH7503	Topics in mathematical programming and optimization (6)	
П	MATH7504	Geometric topology (6)	
П	MATH7505	Real analysis (6)	
П	3. Capstone requirement (6 cre	edits)	
П	At least 6 credits selected from	m the following courses:	
П	MATH3999	Directed studies in mathematics (6)	
П	MATH4910	Senior mathematics seminar (6)	
П	MATH4911	Mathematics capstone project (6)	
Ш	MATH4966	Mathematics internship (6)	
Ш	MATH4999	Mathematics project (12)	
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- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Mathematics

Offered to students 2017

admitted to Year 1 in

Objectives:

The Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize fundamental knowledge and concepts in Mathematics and elective courses provide training in both pure and applied aspects of Mathematics. Throughout the curriculum there is also emphasis on experiential learning through guided studies, projects, seminars and summer internships. With the diversity of courses offered in the major, various specializations are available. These will lead to careers in a wide range of sectors including education, economics and finance, analytics and data science, logistics, management, research and further studies.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present fundamental concepts in mathematics (by means of coursework and learning activities in the major or minor curriculum)
- PLO 2: apply mathematical theory and techniques to different areas of Sciences, and appraise the related ethical issues (by means of coursework and learning activities in the major or minor curriculum)
- PLO 3: communicate in mathematical language and present scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics (Intensive)

Major in Mathematics/Physics

Minor in Computational & Financial Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

MATH1013 University mathematics II (6)

MATH2012 Fundamental concepts of mathematics (6)

MATH2101 Linear algebra I (6)
MATH2102 Linear algebra II (6)
MATH2211 Multivariable calculus (6)

MATH2241 Introduction to mathematical analysis (6)

2. Advanced level courses (42 credits)

Disciplinary Core Course (6 credits)

MATH3401 Analysis I (6)

Disciplinary Electives (36 credits)

At least 36 credits advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), of which at least 12 credits are selected from List A and at least 12 credits should be from MATH4XXX or MATH7XXX level, subject to pre-requisite requirements. The current list includes courses in List A, List B and those courses not selected to fulfill the capstone requirements, but excluding MATH4966 Mathematics Internship.

List A

MATH3301 Algebra I (6)

MATH3403 Functions of a complex variable (6)
MATH3601 Numerical analysis (6)
MATH3603 Probability theory (6)

MATH3904 Introduction to optimization (6)

List B

MATH3001 Development of mathematical ideas (6)

MATH3002 Mathematics seminar (6)

MATH3303 Matrix theory and its applications (6)
MATH3304 Introduction to number theory (6)
MATH3405 Differential equations (6)

MATH3408 Computational methods and differential equations with

applications (6)

MATH3541 Introduction to topology (6)
MATH3600 Discrete mathematics (6)
MATH3901 Operations research I (6)

MATH3905 Queueing theory and simulation (6) MATH3906 Financial calculus (6)

MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6)

MATH4302 Algebra II (6) MATH4402 Analysis II (6)

l	MATH4404	Functional analysis (6)	
П	MATH4406	Introduction to partial differential equations (6)	
П	MATH4501	Geometry (6)	
П	MATH4511	Introduction to differentiable manifolds (6)	
П	MATH4602	Scientific computing (6)	
П	MATH4902	Operations research II (6)	
П	MATH4907	Numerical methods for financial calculus (6)	
П	MATH7101	Intermediate complex analysis (6)	
П	MATH7201	Topics in geometry (6)	
П	MATH7202	Complex manifolds (6)	
П	MATH7217	Topics in financial mathematics (6)	
П	MATH7219	Topics in applied functional analysis (6)	
П	MATH7224	Topics in advanced probability theory (6)	
П	MATH7501	Topics in algebra (6)	
П	MATH7502	Topics in applied discrete mathematics (6)	
П	MATH7503	Topics in mathematical programming and optimization (6)	
П	MATH7504	Geometric topology (6)	
П	MATH7505	Real analysis (6)	
П	3. Capstone requirement (6 cr		
П	At least 6 credits selected fro	<u> </u>	
П	MATH3999	Directed studies in mathematics (6)	
П	MATH4910	Senior mathematics seminar (6)	
П	MATH4911	Mathematics capstone project (6)	
П	MATH4966	Mathematics internship (6)	
П	MATH4999	Mathematics project (12)	
Ш			

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks

Major Title Major in Mathematics

Offered to students 2016

admitted to Year 1 in

Objectives:

The Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize fundamental knowledge and concepts in Mathematics and elective courses provide training in both pure and applied aspects of Mathematics. Throughout the curriculum there is also emphasis on experiential learning through guided studies, projects, seminars and summer internships. With the diversity of courses offered in the major, various specializations are available. These will lead to careers in a wide range of sectors including education, economics and finance, analytics and data science, logistics, management, research and further studies.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present fundamental concepts in mathematics (by means of coursework and learning activities in the major or minor curriculum)
- PLO 2: apply mathematical theory and techniques to different areas of Sciences, and appraise the related ethical issues (by means of coursework and learning activities in the major or minor curriculum)
- PLO 3: communicate in mathematical language and present scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics (Intensive)

Major in Mathematics/Physics

Minor in Computational & Financial Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

MATH1013 University mathematics II (6)

MATH2012 Fundamental concepts of mathematics (6)

MATH2101 Linear algebra I (6)
MATH2102 Linear algebra II (6)
MATH2211 Multivariable calculus (6)

MATH2241 Introduction to mathematical analysis (6)

2. Advanced level courses (42 credits)

Disciplinary Core Course (6 credits)

MATH3401 Analysis I (6)

Disciplinary Electives (36 credits)

At least 36 credits advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), of which at least 12 credits are selected from List A and at least 12 credits should be from MATH4XXX or MATH7XXX level, subject to pre-requisite requirements. The current list includes courses in List A, List B and those courses not selected to fulfill the capstone requirements, but excluding MATH4966 Mathematics Internship.

List A

MATH3301 Algebra I (6)

MATH3403 Functions of a complex variable (6)
MATH3601 Numerical analysis (6)
MATH3603 Probability theory (6)

MATH3904 Introduction to optimization (6)

List B

MATH3001 Development of mathematical ideas (6)

MATH3002 Mathematics seminar (6)

MATH3303 Matrix theory and its applications (6)
MATH3304 Introduction to number theory (6)
MATH3405 Differential equations (6)

MATH3408 Computational methods and differential equations with

applications (6)

MATH3541 Introduction to topology (6)
MATH3600 Discrete mathematics (6)
MATH3901 Operations research I (6)

MATH3905 Queueing theory and simulation (6) MATH3906 Financial calculus (6)

MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6)

MATH4302 Algebra II (6)
MATH4402 Analysis II (6)

l	MATH4404	Functional analysis (6)	
П	MATH4406	Introduction to partial differential equations (6)	ı
П	MATH4501	Geometry (6)	
П	MATH4511	Introduction to differentiable manifolds (6)	ı
П	MATH4602	Scientific computing (6)	ı
П	MATH4902	Operations research II (6)	ı
П	MATH4907	Numerical methods for financial calculus (6)	
П	MATH7101	Intermediate complex analysis (6)	ı
П	MATH7201	Topics in geometry (6)	
П	MATH7202	Complex manifolds (6)	
П	MATH7217	Topics in financial mathematics (6)	
П	MATH7219	Topics in applied functional analysis (6)	
П	MATH7224	Topics in advanced probability theory (6)	
П	MATH7501	Topics in algebra (6)	ı
П	MATH7502	Topics in applied discrete mathematics (6)	ı
П	MATH7503	Topics in mathematical programming and optimization (6)	
П	MATH7504	Geometric topology (6)	ı
П	MATH7505	Real analysis (6)	
П	3. Capstone requirement (
П		from the following courses:	
П	MATH3999	Directed studies in mathematics (6)	ı
П	MATH4910	Senior mathematics seminar (6)	
П	MATH4911	Mathematics capstone project (6)	ı
	MATH4966	Mathematics internship (6)	1
	MATH4999	Mathematics project (12)	ı
П			ı

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks

Major Title Major in Mathematics

Offered to students 2015

admitted to Year 1 in

Objectives:

The Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize fundamental knowledge and concepts in Mathematics and elective courses provide training in both pure and applied aspects of Mathematics. Throughout the curriculum there is also emphasis on experiential learning through guided studies, projects, seminars and summer internships. With the diversity of courses offered in the major, various specializations are available. These will lead to careers in a wide range of sectors including education, economics and finance, analytics and data science, logistics, management, research and further studies.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present fundamental concepts in mathematics (by means of coursework and learning activities in the major or minor curriculum)
- PLO 2: apply mathematical theory and techniques to different areas of Sciences, and appraise the related ethical issues (by means of coursework and learning activities in the major or minor curriculum)
- PLO 3: communicate in mathematical language and present scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics/Physics

Minor in Computational & Financial Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

MATH1013 University mathematics II (6)

MATH2012 Fundamental concepts of mathematics (6)

MATH2101 Linear algebra I (6)
MATH2102 Linear algebra II (6)
MATH2211 Multivariable calculus (6)

MATH2241 Introduction to mathematical analysis (6)

2. Advanced level courses (42 credits)

Disciplinary Core Course (6 credits)

MATH3401 Analysis I (6)

Disciplinary Electives (36 credits)

At least 36 credits advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), of which at least 12 credits are selected from List A and at least 12 credits should be from MATH4XXX or MATH7XXX level, subject to pre-requisite requirements. The current list includes courses in List A, List B and those courses not selected to fulfill the capstone requirements, but excluding MATH4966 Mathematics Internship.

List A

MATH3301 Algebra I (6)

MATH3403 Functions of a complex variable (6)
MATH3601 Numerical analysis (6)
MATH3603 Probability theory (6)

MATH3904 Introduction to optimization (6)

List B

MATH3001 Development of mathematical ideas (6)

MATH3001

MATH3002

Mathematics seminar (6)

MATH3303

Matrix theory and its applications (6)

MATH3304

Introduction to number theory (6)

MATH3405 Differential equations (6)

MATH3408 Computational methods and differential equations with

applications (6)

MATH3541 Introduction to topology (6)
MATH3600 Discrete mathematics (6)
MATH3901 Operations research I (6)
MATH3905 Queueing theory and simulation (6)

MATH3905 Queueing theory and simulation (6 MATH3906 Financial calculus (6) MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6)

MATH4302 Algebra II (6)
MATH4402 Analysis II (6)
MATH4404 Functional analysis (6)

	MATH4406	Introduction to partial differential equations (6)	
	MATH4501	Geometry (6)	
	MATH4511	Introduction to differentiable manifolds (6)	
	MATH4602	Scientific computing (6)	
	MATH4902	Operations research II (6)	
	MATH4907	Numerical methods for financial calculus (6)	
	MATH7101	Intermediate complex analysis (6)	
	MATH7201	Topics in geometry (6)	
	MATH7202	Complex manifolds (6)	
	MATH7217	Topics in financial mathematics (6)	
	MATH7219	Topics in applied functional analysis (6)	
	MATH7224	Topics in advanced probability theory (6)	
	MATH7501	Topics in algebra (6)	
	MATH7502	Topics in applied discrete mathematics (6)	
	MATH7503	Topics in mathematical programming and optimization (6)	
	MATH7504	Geometric topology (6)	
	MATH7505	Real analysis (6)	
	3. Capstone requirement (6	6 credits)	
	At least 6 credits selected	from the following courses:	
	MATH3999	Directed studies in mathematics (6)	
	MATH4910	Senior mathematics seminar (6)	
	MATH4911	Mathematics capstone project (6)	
	MATH4966	Mathematics internship (6)	
	MATH4999	Mathematics project (12)	
П			

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Mathematics

Offered to students 2014

admitted to Year 1 in

Objectives:

The Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize fundamental knowledge and concepts in Mathematics and elective courses provide training in both pure and applied aspects of Mathematics. Throughout the curriculum there is also emphasis on experiential learning through guided studies, projects, seminars and summer internships. With the diversity of courses offered in the major, various specializations are available. These will lead to careers in a wide range of sectors including education, economics and finance, analytics and data science, logistics, management, research and further studies.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present fundamental concepts in mathematics (by means of coursework and learning activities in the major or minor curriculum)
- PLO 2: apply mathematical theory and techniques to different areas of Sciences, and appraise the related ethical issues (by means of coursework and learning activities in the major or minor curriculum)
- PLO 3: communicate in mathematical language and present scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics/Physics

Minor in Computational & Financial Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) Scientific method and reasoning (6) SCNC1111 Fundamentals of modern science (6) **SCNC1112**

Disciplinary Core Courses (36 credits)

MATH1013 University mathematics II (6)

MATH2012 Fundamental concepts of mathematics (6)

MATH2101 Linear algebra I (6) Linear algebra II (6) MATH2102 Multivariable calculus (6) **MATH2211**

Introduction to mathematical analysis (6) **MATH2241**

2. Advanced level courses (42 credits)

Disciplinary Core Courses (18 credits) MATH3301

Algebra I (6) Analysis I (6) MATH3401

MATH3403 Functions of a complex variable (6)

Disciplinary Electives (24 credits)

At least 24 credits advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), of which at least 12 credits should be from MATH4XXX or MATH7XXX level, subject to pre-requisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements, but excluding MATH4966 Mathematics Internship.

List A	
MATH3001	Development of mathematical ideas (6)
MATH3002	Mathematics seminar (6)
MVLM33U3	Matrix theory and its applications (6)

Matrix theory and its applications (6) MATH3303 MATH3304 Introduction to number theory (6) MATH3405 Differential equations (6)

Computational methods and differential equations with MATH3408

applications (6) Introduction to topology (6) MATH3541 MATH3600 Discrete mathematics (6) MATH3601 Numerical analysis (6)

MATH3603 Probability theory (6) Operations research I (6) MATH3901 Introduction to optimization (6) MATH3904 MATH3905 Queueing theory and simulation (6)

MATH3906 Financial calculus (6) MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6)

MATH4302 Algebra II (6) MATH4402 Analysis II (6) **MATH4404** Functional analysis (6)

Introduction to partial differential equations (6) MATH4406

I II		
MATH4501	Geometry (6)	
MATH4511	Introduction to differentiable manifolds (6)	
MATH4602	Scientific computing (6)	
MATH4902	Operations research II (6)	
MATH4907	Numerical methods for financial calculus (6)	
MATH7101	Intermediate complex analysis (6)	
MATH7201	Topics in geometry (6)	
MATH7202	Complex manifolds (6)	
MATH7217	Topics in financial mathematics (6)	
MATH7219	Topics in applied functional analysis (6)	
MATH7224	Topics in advanced probability theory (6)	
MATH7501	Topics in algebra (6)	
MATH7502	Topics in applied discrete mathematics (6)	
MATH7503	Topics in mathematical programming and optimization (6)	
MATH7504	Geometric topology (6)	
MATH7505	Real analysis (6)	
3. Capstone requirement (6 cred	its)	
At least 6 credits selected from	the following courses:	
MATH3999	Directed studies in mathematics (6)	
MATH4910	Senior mathematics seminar (6)	
MATH4911	Mathematics capstone project (6)	
MATH4966	Mathematics internship (6)	
MATH4999	Mathematics project (12)	

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Mathematics

Offered to students 2013

admitted to Year 1 in

Objectives:

The Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize fundamental knowledge and concepts in Mathematics and elective courses provide training in both pure and applied aspects of Mathematics. Throughout the curriculum there is also emphasis on experiential learning through guided studies, projects, seminars and summer internships. With the diversity of courses offered in the major, various specializations are available. These will lead to careers in a wide range of sectors including education, economics and finance, analytics and data science, logistics, management, research and further studies.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present fundamental concepts in mathematics (by means of coursework and learning activities in the major or minor curriculum)
- PLO 2: apply mathematical theory and techniques to different areas of Sciences, and appraise the related ethical issues (by means of coursework and learning activities in the major or minor curriculum)
- PLO 3: communicate in mathematical language and present scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics/Physics

Minor in Computational & Financial Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) Scientific method and reasoning (6) SCNC1111 Fundamentals of modern science (6) **SCNC1112**

Disciplinary Core Courses (36 credits)

MATH1013 University mathematics II (6)

MATH2012 Fundamental concepts of mathematics (6)

MATH2101 Linear algebra I (6) Linear algebra II (6) MATH2102 Multivariable calculus (6) **MATH2211**

Introduction to mathematical analysis (6) MATH2241

2. Advanced level courses (42 credits) **Disciplinary Core Courses (18 credits)**

MATH3301

Algebra I (6) Analysis I (6) MATH3401

MATH3403 Functions of a complex variable (6)

Disciplinary Electives (24 credits)

At least 24 credits advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), of which at least 12 credits should be from MATH4XXX or MATH7XXX level, subject to pre-requisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements, but excluding MATH4966 Mathematics Internship.

MATH3001 Development of mathematical ideas (6)

MATH3002 Mathematics seminar (6)

MATH3303 Matrix theory and its applications (6) Introduction to number theory (6) MATH3304

Differential equations (6) MATH3405

Computational methods and differential equations with **MATH3408**

applications (6)

Introduction to topology (6) MATH3541 MATH3600 Discrete mathematics (6) MATH3601 Numerical analysis (6) MATH3603 Probability theory (6) Operations research I (6) MATH3901 Introduction to optimization (6) MATH3904 MATH3905 Queueing theory and simulation (6)

MATH3906 Financial calculus (6) MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6)

MATH4302 Algebra II (6) MATH4402 Analysis II (6) **MATH4404** Functional analysis (6)

Introduction to partial differential equations (6) MATH4406

l	MATH4501	Geometry (6)	
П	MATH4511	Introduction to differentiable manifolds (6)	
П	MATH4602	Scientific computing (6)	
П	MATH4902	Operations research II (6)	
П	MATH4907	Numerical methods for financial calculus (6)	
П	MATH7101	Intermediate complex analysis (6)	
П	MATH7201	Topics in geometry (6)	
П	MATH7202	Complex manifolds (6)	
П	MATH7217	Topics in financial mathematics (6)	
П	MATH7219	Topics in applied functional analysis (6)	
П	MATH7224	Topics in advanced probability theory (6)	
П	MATH7501	Topics in algebra (6)	
П	MATH7502	Topics in applied discrete mathematics (6)	
П	MATH7503	Topics in mathematical programming and optimization (6)	
П	MATH7504	Geometric topology (6)	
П	MATH7505	Real analysis (6)	
П	3. Capstone requirement (6	6 credits)	
П	At least 6 credits selected	from the following courses:	
П	MATH3999	Directed studies in mathematics (6)	
П	MATH4910	Senior mathematics seminar (6)	
П	MATH4911	Mathematics capstone project (6)	
П	MATH4966	Mathematics internship (6)	
П	MATH4999	Mathematics project (12)	
П			

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Mathematics

Offered to students 2012

admitted to Year 1 in

Objectives:

The Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize fundamental knowledge and concepts in Mathematics and elective courses provide training in both pure and applied aspects of Mathematics. Throughout the curriculum there is also emphasis on experiential learning through guided studies, projects, seminars and summer internships. With the diversity of courses offered in the major, various specializations are available. These will lead to careers in a wide range of sectors including education, economics and finance, analytics and data science, logistics, management, research and further studies.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present fundamental concepts in mathematics (by means of coursework and learning activities in the major or minor curriculum)
- PLO 2: apply mathematical theory and techniques to different areas of Sciences, and appraise the related ethical issues (by means of coursework and learning activities in the major or minor curriculum)
- PLO 3: communicate in mathematical language and present scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics/Physics

Minor in Computational & Financial Mathematics

Minor in Mathematics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) SCNC1111 Scientific method and reasoning (6)

SCNC1111 Scientific Hetriod and reasoning (b)
SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

MATH1013 University mathematics II (6)

MATH2012 Fundamental concepts of mathematics (6)

MATH2101 Linear algebra I (6)
MATH2102 Linear algebra II (6)
MATH2211 Multivariable calculus (6)

MATH2241 Introduction to mathematical analysis (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (18 credits)

MATH3301 Algebra I (6) MATH3401 Analysis I (6)

MATH3403 Functions of a complex variable (6)

Disciplinary Electives (24 credits)

At least 24 credits advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), of which at least 12 credits should be from MATH4XXX or MATH7XXX level, subject to pre-requisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements, but excluding MATH4966 Mathematics Internship.

List A

MATH3001 Development of mathematical ideas (6)

MATH3002 Mathematics seminar (6)

MATH3303 Matrix theory and its applications (6) MATH3304 Introduction to number theory (6)

MATH3405 Differential equations (6)
MATH3408 Computational methods and differential equations with

applications (6)
MATH3541 Introduction to topology (6)
MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3603 Probability theory (6)

MATH3901 Operations research I (6)
MATH3904 Introduction to optimization (6)
MATH3905 Queueing theory and simulation (6)
MATH3906 Financial calculus (6)

MATH3911 Game theory and strategy (6)
MATH3943 Network models in operations research (6)

MATH4302 Algebra II (6) MATH4402 Analysis II (6)

MATH4404 Functional analysis (6)
MATH4406 Introduction to partial differential equations (6)

MATH4501 Geometry (6)

١.		
П	MATH4511	Introduction to differentiable manifolds (6)
П	MATH4602	Scientific computing (6)
П	MATH4902	Operations research II (6)
П	MATH4907	Numerical methods for financial calculus (6)
П	MATH7101	Intermediate complex analysis (6)
П	MATH7201	Topics in geometry (6)
П	MATH7202	Complex manifolds (6)
П	MATH7217	Topics in financial mathematics (6)
П	MATH7219	Topics in applied functional analysis (6)
П	MATH7224	Topics in advanced probability theory (6)
П	MATH7501	Topics in algebra (6)
П	MATH7502	Topics in applied discrete mathematics (6)
П	MATH7503	Topics in mathematical programming and optimization (6)
П	MATH7504	Geometric topology (6)
П	MATH7505	Real analysis (6)
П	3. Capstone requirement	(6 credits)
П	At least 6 credits selecte	ed from the following courses:
П	MATH3999	Directed studies in mathematics (6)
П	MATH4910	Senior mathematics seminar (6)
П	MATH4911	Mathematics capstone project (6)
	MATH4966	Mathematics internship (6)
	MATH4999	Mathematics project (12)

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Mathematics (Intensive)

Offered to students 2020

admitted to Year 1 in

Objectives:

The Intensive Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize a firm foundation in Mathematics. The strong emphasis on experiential learning in guided studies, projects, seminars or summer internships provides more opportunities for students to carry out research based studies and to develop their expertise. Graduates are expected to have strong academic ability to pursue graduate studies or professional careers that require in-depth mathematical training.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present a variety of concepts and theories in mathematics (by means of coursework and learning activities in the curriculum)
- PLO 2: apply mathematical theory and techniques to handle research-style questions, scrutinize problems, and appraise the related ethical issues (by means of coursework and learning activities in the curriculum)
- PLO 3: communicate in mathematical language, and present mathematical ideas and scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics

Minor in Computational & Financial Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

<u> </u>	ch & Mathematical Programming			
Required courses (14	•			
1. Introductory level courses (48 credits)				
Disciplinary Core Courses: Science Foundation Courses (12 credits)				
SCNC1111	Scientific method and reasoning (6)	(Note 1)		
SCNC1112	Fundamentals of modern science (6)	(Note 1)		
Disciplinary Core Cours				
MATH1013	University mathematics II (6)	(Note 1)		
MATH2012	Fundamental concepts of mathematics (6)	(Note 1)		
MATH2101	Linear algebra I (6)	(Note 1)		
MATH2102	Linear algebra II (6)	(Note 1)		
MATH2211	Multivariable calculus (6)	(Note 1)		
MATH2241	Introduction to mathematical analysis (6)	(Note 1)		
2. Advanced level cours	ses (84 credits)			
Disciplinary Core Cours				
MATH3002	Mathematics seminar (6)			
MATH3301	Algebra I (6)			
MATH3401	Analysis I (6)	(Note 1)		
MATH3403	Functions of a complex variable (6)			
MATH3405	Differential equations (6)			
MATH3600	Discrete mathematics (6)			
MATH3603	Probability theory (6)			
MATH3904	Introduction to optimization (6)			
MATH4404	Functional analysis (6)			
MATH4406	Introduction to partial differential equations (6)			
Disciplinary Electives (2	24 credits)			
Select Stream (A) or S	Stream (B):			
(A) Pure Mathematics	(at least 24 credits with 12 credits from MATH7XXX level, subject t	to pre-requisite requirement)		
MATH3541	Introduction to topology (6)			
MATH4302	Algebra II (6)			
MATH4402	Analysis II (6)			
MATH4501	Geometry (6)			
MATH4511	Introduction to differentiable manifolds (6)			
MATH7101	Intermediate complex analysis (6)			
MATH7201	Topics in geometry (6)			
MATH7202	Complex manifolds (6)			
MATH7501	Topics in algebra (6)			
MATH7505	Real analysis (6)			
	ics (at least 24 credits with 12 credits from MATH4XXX or MATH7X	XXX level, subject to pre-		
requisite requirement)	Numerical analysis (6)			
MATH3601	Numerical analysis (6)			
MATH3901	Operations research I (6)			
MATH3906	Financial calculus (6)			
MATH3911	Game theory and strategy (6)			
MATH3943	Network models in operations research (6)			

MATH4602 Scientific computing (6) MATH4902 Operations research II (6)

MATH4907 Numerical methods for financial calculus (6)
MATH7217 Topics in financial mathematics (6)
MATH7224 Topics in advanced probability theory (6)
MATH7502 Topics in applied discrete mathematics (6)

MATH7503 Topics in mathematical programming and optimization (6)

3. Capstone requirement (12 credits)

At least 12 credits selected from the following courses:

MATH3999 Directed studies in mathematics (6)
MATH4910 Senior mathematics seminar (6)
MATH4911 Mathematics capstone project (6)
MATH4966 Mathematics internship (6)
MATH4999 Mathematics project (12)

Notes:

- 1. These are core courses in the regular Mathematics Major (96 credits) curriculum.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.
- 4. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks

Major Title Major in Mathematics (Intensive)

Offered to students 2019

admitted to Year 1 in

Objectives:

The Intensive Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize a firm foundation in Mathematics. The strong emphasis on experiential learning in guided studies, projects, seminars or summer internships provides more opportunities for students to carry out research based studies and to develop their expertise. Graduates are expected to have strong academic ability to pursue graduate studies or professional careers that require in-depth mathematical training.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present a variety of concepts and theories in mathematics (by means of coursework and learning activities in the curriculum)
- PLO 2: apply mathematical theory and techniques to handle research-style questions, scrutinize problems, and appraise the related ethical issues (by means of coursework and learning activities in the curriculum)
- PLO 3: communicate in mathematical language, and present mathematical ideas and scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics

Minor in Computational & Financial Mathematics

Minor in Mathematics

linor in Operations Research & Mathematical Programming			
Required courses (144 credits)			
1. Introductory level courses (48 credits)			
	ses: Science Foundation Courses (12 credits)		
SCNC1111	Scientific method and reasoning (6)	(Note 1)	
SCNC1112	Fundamentals of modern science (6)	(Note 1)	
Disciplinary Core Cour	ses (36 credits)	,	
MATH1013	University mathematics II (6)	(Note 1)	
MATH2012	Fundamental concepts of mathematics (6)	(Note 1)	
MATH2101	Linear algebra I (6)	(Note 1)	
MATH2102	Linear algebra II (6)	(Note 1)	
MATH2211	Multivariable calculus (6)	(Note 1)	
MATH2241	Introduction to mathematical analysis (6)	(Note 1)	
2. Advanced level cour	ses (84 credits)		
Disciplinary Core Cour			
MATH3002	Mathematics seminar (6)		
MATH3301	Algebra I (6)		
MATH3401	Analysis I (6)	(Note 1)	
MATH3403	Functions of a complex variable (6)		
MATH3405	Differential equations (6)		
MATH3600	Discrete mathematics (6)		
MATH3603	Probability theory (6)		
MATH3904	Introduction to optimization (6)		
MATH4404	Functional analysis (6)		
MATH4406	Introduction to partial differential equations (6)		
Disciplinary Electives (24 credits)		
Select Stream (A) or S			
(A) Pure Mathematics	s (at least 24 credits with 12 credits from MATH7XXX level, subjec	t to pre-requisite requirement)	
MATH3541	Introduction to topology (6)		
MATH4302	Algebra II (6)		
MATH4402	Analysis II (6)		
MATH4501	Geometry (6)		
MATH4511	Introduction to differentiable manifolds (6)		
MATH7101	Intermediate complex analysis (6)		
MATH7201	Topics in geometry (6)		
MATH7202	Complex manifolds (6)		
MATH7501	Topics in algebra (6)		
MATH7505	Real analysis (6)		
	tics (at least 24 credits with 12 credits from MATH4XXX or MATH7	7XXX level, subject to pre-	
requisite requirement,			
MATH3601	Numerical analysis (6)		
MATH3901	Operations research I (6)		
MATH3906	Financial calculus (6)		
MATH3911	Game theory and strategy (6)		
MATH3943	Network models in operations research (6)		

MATH4602 Scientific computing (6)
MATH4902 Operations research II (6)

MATH4907 Numerical methods for financial calculus (6)
MATH7217 Topics in financial mathematics (6)
MATH7224 Topics in advanced probability theory (6)
MATH7502 Topics in applied discrete mathematics (6)

MATH7503 Topics in mathematical programming and optimization (6)

3. Capstone requirement (12 credits)

At least 12 credits selected from the following courses:

MATH3999 Directed studies in mathematics (6)
MATH4910 Senior mathematics seminar (6)
MATH4911 Mathematics capstone project (6)
MATH4966 Mathematics internship (6)
MATH4999 Mathematics project (12)

Notes:

- 1. These are core courses in the regular Mathematics Major (96 credits) curriculum.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks

Major Title Major in Mathematics (Intensive)

Offered to students 2018

admitted to Year 1 in

Objectives:

The Intensive Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize a firm foundation in Mathematics. The strong emphasis on experiential learning in guided studies, projects, seminars or summer internships provides more opportunities for students to carry out research based studies and to develop their expertise. Graduates are expected to have strong academic ability to pursue graduate studies or professional careers that require in-depth mathematical training.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present a variety of concepts and theories in mathematics (by means of coursework and learning activities in the curriculum)
- PLO 2: apply mathematical theory and techniques to handle research-style questions, scrutinize problems, and appraise the related ethical issues (by means of coursework and learning activities in the curriculum)
- PLO 3: communicate in mathematical language, and present mathematical ideas and scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics

Minor in Computational & Financial Mathematics

Minor in Mathematics

linor in Operations Resea	rch & Mathematical Programming	
Required courses (14	4 credits)	
1. Introductory level co	•	
	ses: Science Foundation Courses (12 credits)	
SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core Cour	ses (36 credits)	,
MATH1013	University mathematics II (6)	(Note 1)
MATH2012	Fundamental concepts of mathematics (6)	(Note 1)
MATH2101	Linear algebra I (6)	(Note 1)
MATH2102	Linear algebra II (6)	(Note 1)
MATH2211	Multivariable calculus (6)	(Note 1)
MATH2241	Introduction to mathematical analysis (6)	(Note 1)
2. Advanced level cour	ses (84 credits)	
Disciplinary Core Cour		
MATH3002	Mathematics seminar (6)	
MATH3301	Algebra I (6)	
MATH3401	Analysis I (6)	(Note 1)
MATH3403	Functions of a complex variable (6)	
MATH3405	Differential equations (6)	
MATH3600	Discrete mathematics (6)	
MATH3603	Probability theory (6)	
MATH3904	Introduction to optimization (6)	
MATH4404	Functional analysis (6)	
MATH4406	Introduction to partial differential equations (6)	
Disciplinary Electives (24 credits)	
Select Stream (A) or S		
(A) Pure Mathematics	s (at least 24 credits with 12 credits from MATH7XXX level, subjec	t to pre-requisite requirement)
MATH3541	Introduction to topology (6)	
MATH4302	Algebra II (6)	
MATH4402	Analysis II (6)	
MATH4501	Geometry (6)	
MATH4511	Introduction to differentiable manifolds (6)	
MATH7101	Intermediate complex analysis (6)	
MATH7201	Topics in geometry (6)	
MATH7202	Complex manifolds (6)	
MATH7501	Topics in algebra (6)	
MATH7505	Real analysis (6)	
	tics (at least 24 credits with 12 credits from MATH4XXX or MATH7	7XXX level, subject to pre-
requisite requirement,		
MATH3601	Numerical analysis (6)	
MATH3901	Operations research I (6)	
MATH3906	Financial calculus (6)	
MATH3911	Game theory and strategy (6)	
MATH3943	Network models in operations research (6)	

MATH4602 Scientific computing (6)
MATH4902 Operations research II (6)

MATH4907 Numerical methods for financial calculus (6)
MATH7217 Topics in financial mathematics (6)
MATH7224 Topics in advanced probability theory (6)
MATH7502 Topics in applied discrete mathematics (6)

MATH7503 Topics in mathematical programming and optimization (6)

3. Capstone requirement (12 credits)

At least 12 credits selected from the following courses:

MATH3999 Directed studies in mathematics (6)
MATH4910 Senior mathematics seminar (6)
MATH4911 Mathematics capstone project (6)
MATH4966 Mathematics internship (6)
MATH4999 Mathematics project (12)

Notes:

- 1. These are core courses in the regular Mathematics Major (96 credits) curriculum.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks

Major Title Major in Mathematics (Intensive)

Offered to students 2017

admitted to Year 1 in

Objectives:

The Intensive Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize a firm foundation in Mathematics. The strong emphasis on experiential learning in guided studies, projects, seminars or summer internships provides more opportunities for students to carry out research based studies and to develop their expertise. Graduates are expected to have strong academic ability to pursue graduate studies or professional careers that require in-depth mathematical training.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present a variety of concepts and theories in mathematics (by means of coursework and learning activities in the curriculum)
- PLO 2: apply mathematical theory and techniques to handle research-style questions, scrutinize problems, and appraise the related ethical issues (by means of coursework and learning activities in the curriculum)
- PLO 3: communicate in mathematical language, and present mathematical ideas and scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics/Physics

Minor in Computational & Financial Mathematics

Minor in Mathematics

equired courses (144	1 credits)	
. Introductory level co	•	
	ses: Science Foundation Courses (12 credits)	
SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core Cours	` '	(11010 1)
MATH1013	University mathematics II (6)	(Note 1)
MATH2012	Fundamental concepts of mathematics (6)	(Note 1)
MATH2101	Linear algebra I (6)	(Note 1)
MATH2102	Linear algebra II (6)	(Note 1)
MATH2211	Multivariable calculus (6)	(Note 1)
MATH2241	Introduction to mathematical analysis (6)	(Note 1)
. Advanced level cours		, ,
Disciplinary Core Cours		
MATH3002	Mathematics seminar (6)	
MATH3301	Algebra I (6)	
MATH3401	Analysis I (6)	(Note 1)
MATH3403	Functions of a complex variable (6)	, ,
MATH3405	Differential equations (6)	
MATH3600	Discrete mathematics (6)	
MATH3603	Probability theory (6)	
MATH3904	Introduction to optimization (6)	
MATH4404	Functional analysis (6)	
MATH4406	Introduction to partial differential equations (6)	
isciplinary Electives (2	24 credits)	
Select Stream (A) or S	Stream (B):	
(A) Pure Mathematics	(at least 24 credits with 12 credits from MATH7XXX level, subject to	pre-requisite requirement)
MATH3541	Introduction to topology (6)	, , ,
MATH4302	Algebra II (6)	
MATH4402	Analysis II (6)	
MATH4501	Geometry (6)	
MATH4511	Introduction to differentiable manifolds (6)	
MATH7101	Intermediate complex analysis (6)	
MATH7201	Topics in geometry (6)	
MATH7202	Complex manifolds (6)	
MATH7501	Topics in algebra (6)	
MATH7505	Real analysis (6)	
(B) Applied Mathemati	cs (at least 24 credits with 12 credits from MATH4XXX or MATH7XX)	X level, subject to pre-
requisite requirement)		
MATH3601	Numerical analysis (6)	
MATH3901	Operations research I (6)	
MATH3906	Financial calculus (6)	
MATH3911	Game theory and strategy (6)	

MATH3943 Network models in operations research (6)

MATH4602 Scientific computing (6)
MATH4902 Operations research II (6)

MATH4907 Numerical methods for financial calculus (6)
MATH7217 Topics in financial mathematics (6)
MATH7224 Topics in advanced probability theory (6)

MATH7502 Topics in applied discrete mathematics (6)
MATH7503 Topics in mathematical programming and optimization (6)

3. Capstone requirement (12 credits)

At least 12 credits selected from the following courses:

MATH3999 Directed studies in mathematics (6)
MATH4910 Senior mathematics seminar (6)
MATH4911 Mathematics capstone project (6)
MATH4966 Mathematics internship (6)
MATH4999 Mathematics project (12)

Notes:

- 1. These are core courses in the regular Mathematics Major (96 credits) curriculum.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Mathematics (Intensive)

Offered to students 2016

admitted to Year 1 in

Objectives:

The Intensive Major in Mathematics provides students with a solid and comprehensive undergraduate education in the subject. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems. Core courses in the curriculum emphasize a firm foundation in Mathematics. The strong emphasis on experiential learning in guided studies, projects, seminars or summer internships provides more opportunities for students to carry out research based studies and to develop their expertise. Graduates are expected to have strong academic ability to pursue graduate studies or professional careers that require in-depth mathematical training.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and present a variety of concepts and theories in mathematics (by means of coursework and learning activities in the curriculum)
- PLO 2: apply mathematical theory and techniques to handle research-style questions, scrutinize problems, and appraise the related ethical issues (by means of coursework and learning activities in the curriculum)
- PLO 3: communicate in mathematical language, and present mathematical ideas and scientific arguments (by means of coursework, seminars, guided studies and projects)
- PLO 4: collaborate and work with other students in an effective manner (by means of guided studies, projects and seminars)
- PLO 5: appreciate the beauty and power of mathematics (by means of guided studies, projects and seminars)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics/Physics

Minor in Computational & Financial Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (144 credits) 1. Introductory level courses (48 credits) Disciplinary Core Courses: Science Foundation Courses (12 credits) SCNC1111 Scientific method and reasoning (6) (Note 1) Fundamentals of modern science (6) **SCNC1112** (Note 1) **Disciplinary Core Courses (36 credits)** MATH1013 University mathematics II (6) (Note 1) Fundamental concepts of mathematics (6) (Note 1) MATH2012 (Note 1) MATH2101 Linear algebra I (6) Linear algebra II (6) (Note 1) MATH2102 Multivariable calculus (6) MATH2211 (Note 1) Introduction to mathematical analysis (6) MATH2241 (Note 1) 2. Advanced level courses (84 credits) **Disciplinary Core Course (60 credits)** Mathematics seminar (6) MATH3002 Algebra I (6) MATH3301 MATH3401 Analysis I (6) (Note 1) MATH3403 Functions of a complex variable (6) Differential equations (6) MATH3405 MATH3600 Discrete mathematics (6) Probability theory (6) MATH3603 MATH3904 Introduction to optimization (6) MATH4404 Functional analysis (6) Introduction to partial differential equations (6) MATH4406 **Disciplinary Electives (24 credits)** Select Stream (A) or Stream (B): (A) Pure Mathematics (at least 24 credits with 12 credits from MATH7XXX level, subject to pre-requisite requirement) MATH3541 Introduction to topology (6) Algebra II (6) MATH4302 MATH4402 Analysis II (6) Geometry (6) MATH4501 Introduction to differentiable manifolds (6) MATH4511 Intermediate complex analysis (6) MATH7101 Topics in geometry (6) MATH7201 MATH7202 Complex manifolds (6) Topics in algebra (6) MATH7501 Real analysis (6) MATH7505 (B) Applied Mathematics (at least 24 credits with 12 credits from MATH4XXX or MATH7XXX level, subject to prerequisite requirement) MATH3601 Numerical analysis (6) MATH3901 Operations research I (6) MATH3906 Financial calculus (6) MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6)

MATH4602 Scientific computing (6)
MATH4902 Operations research II (6)

MATH4907 Numerical methods for financial calculus (6)

MATH7217 Topics in financial mathematics (6)
MATH7224 Topics in advanced probability theory (6)
MATH7502 Topics in applied discrete mathematics (6)

MATH7503 Topics in mathematical programming and optimization (6)

3. Capstone requirement (12 credits)

At least 12 credits selected from the following courses:

MATH3999 Directed studies in mathematics (6)
MATH4910 Senior mathematics seminar (6)
MATH4911 Mathematics capstone project (6)
MATH4999 Mathematics project (12)
MATH4966 Mathematics internship (6)

Notes:

- 1. These are core courses in the regular Mathematics Major (96 credits) curriculum.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Mathematics/Physics

Offered to students 2017

admitted to Year 1 in

Objectives:

The Major in Mathematics/Physics aims to provide students with a solid foundation in both physics and mathematics. This major is catered especially for students interested in the more theoretical aspects of physics. It covers a wide range of core areas in both disciplines which form the blocks of fundamental knowledge for further specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics, electrodynamics, linear algebra, mathematical analysis, abstract algebra, complex variables, differential equations, modern differential geometry, etc. A large selection of elective courses is provided for students to pursue a broad spectrum of professional knowledge in mathematical and theoretical physics. Analytical thinking, quantitative reasoning and innovative ideas are fostered through the effective design of courses and research projects. The curriculum emphasizes experiential learning through internships, field studies and research projects supervised by experts. With the comprehensive training received, graduates are expected to be well-prepared for further studies and to pursue careers in many fields of science and engineering.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with a rigorous representation using their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle physical problems with intellectual rigor theoretically (by means of coursework, tutorial classes and assessments in the curriculum)
- PLO 3: apply mathematical theory and techniques to analyze physical problems qualitatively and quantitatively, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-world setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Mathematics

Major in Physics

Minor in Computational & Financial Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) SCNC1111 Scientific method and reasoning (6)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6)
MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)
PHYS1250 Fundamental physics (6)
PHYS2265 Introductory quantum physics (6)

Disciplinary Electives (6 credits)

At least 6 credits selected from the following courses:
PHYS1150 Problem solving in physics (6)

PHYS2055 Introductory relativity (6)
PHYS2150 Methods in physics I (6)
PHYS2155 Methods in physics II (6)
PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)

PHYS2260 Heat and waves (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (36 credits)

MATH3301 Algebra I (6)
MATH3401 Analysis I (6)
MATH4501 Geometry (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS4351 Advanced quantum mechanics (6)

Disciplinary Electives (6 credits)

At least 6 credits of advanced level Mathematics or Physics courses (MATH3XXX or MATH4XXX or MATH7XXX or PHYS3XXX or PHYS7XXX level), subject to prerequisite requirements. The current list of courses include courses in List A and those courses not selected to fulfill the capstone requirement, but excluding MATH4966 Mathematics Internship.

List A

MATH3001 Development of mathematical ideas (6)

MATH3002	Mathematics seminar (6)	
	Matrix theory and its applications (6)	
MATH3303	• • • • • • • • • • • • • • • • • • • •	
MATH3304	Introduction to number theory (6)	
MATH3403	Functions of a complex variable (6)	
MATH3405	Differential equations (6)	
	Computational methods and differential equations with	
MATH3408	·	
	applications (6)	
MATH3541	Introduction to topology (6)	
MATH3600	Discrete mathematics (6)	
MATH3601	Numerical analysis (6)	
MATH3603	Probability theory (6)	
MATH3901	Operations research I (6)	
MATH3904	Introduction to optimization (6)	
MATH3905	Queueing theory and simulation (6)	
MATH3906	Financial calculus (6)	
MATH3911	Game theory and strategy (6)	
MATH3943	Network models in operations research (6)	
MATH4302	Algebra II (6)	
MATH4402	Analysis II (6)	
	• • •	
MATH4404	Functional analysis (6)	
∥ MATH4406	Introduction to partial differential equations (6)	
MATH4511	Introduction to differentiable manifolds (6)	
MATH4602	Scientific computing (6)	
MATH4902	Operations research II (6)	
	. ,	
MATH4907	Numerical methods for financial calculus (6)	
MATH7101	Intermediate complex analysis (6)	
MATH7201	Topics in geometry (6)	
MATH7202	Complex manifolds (6)	
	. , ,	
MATH7217	Topics in financial mathematics (6)	
MATH7219	Topics in applied functional analysis (6)	
MATH7224	Topics in advanced probability theory (6)	
MATH7501	Topics in algebra (6)	
MATH7502	Topics in applied discrete mathematics (6)	
MATH7503	Topics in mathematical programming and optimization (6)	
MATH7504	Geometric topology (6)	
MATH7505	Real analysis (6)	
PHYS3150	Theoretical physics (6)	
PHYS3151	Machine learning in physics (6)	
PHYS3450	Electromagnetism (6)	
PHYS3550	Statistical mechanics & thermodynamics (6)	
PHYS3551	Introductory solid state physics (6)	
PHYS3650	Observational astronomy (6)	
PHYS3651	The physical universe (6)	
PHYS3652	Principles of astronomy (6)	
PHYS3653	Astrophysics (6)	
PHYS3660	Astronomy laboratory (6)	
DI I) (00750	Laser and spectroscopy (6)	
PHYS3/50		
PHYS3751	Physics of nanomaterials (6)	
PHYS3760	Physics laboratory (6)	
PHYS3850	Physical Optics (6)	[previous title: Waves and optics
	, , , ,	 (6)]
PHYS3851	Atomic and nuclear physics (6)	(-)]
	Computational physics (6)	
PHYS4150		
PHYS4151	Data analysis and modeling in physics (6)	
PHYS4350	Advanced classical mechanics (6)	
PHYS4450	Advanced electromagnetism (6)	
PHYS4550	Advanced statistical mechanics (6)	
	Solid state physics (6)	
PHYS4551		
PHYS4650	Stellar physics (6)	
PHYS4651	Selected topics in astrophysics (6)	
PHYS4652	Planetary science (6)	
PHYS4653	Cosmology (6)	
	General relativity (6)	
PHYS4654		
PHYS4655	Interstellar medium (6)	
PHYS4656	Advanced astrophysics (6)	
PHYS4750	Experimental physics (6)	
PHYS4850	Particle physics (6)	
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PHYS7350	Graduate classical mechanics (6)	
PHYS7351	Graduate quantum mechanics (6)	
PHYS7450	Graduate electromagnetism (6)	
PHYS7550	Graduate statistical mechanics (6)	
PHYS7551	Graduate solid state physics (6)	
PHYS7650	Stellar atmospheres (6)	
PHYS7750	Nanophysics (6)	
3. Capstone requirement (6		
At least 6 credits selected f		
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MATH3999 MATH4910 MATH4911 MATH4966 MATH4999 PHYS3999 PHYS4966	Directed studies in mathematics (6) Senior mathematics seminar (6) Mathematics capstone project (6) Mathematics internship (6) Mathematics project (12) Directed studies in physics (6) Physics internship (6)
	, , ,
PHYS4999	Physics project (12)

- 1. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 6. (a) Students must have level 3 or above in HKDSE Physics or HKDSE Combined Science with Physics component or equivalent to take this major. Students who do not fufill this requirement are advised to take PHYS1240 Physics by inquiry; and
- (b) Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fufill this requirement are advised to take MATH1011 University mathematics I.
- 7. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at http://www.scifac.hku.hk/ug/current/bsc/curriculum/overlapping-course-req.

Remarks:

Major Title Major in Mathematics/Physics

Offered to students 2016

admitted to Year 1 in

Objectives:

The Major in Mathematics/Physics aims to provide students with a solid foundation in both physics and mathematics. This major is catered especially for students interested in the more theoretical aspects of physics. It covers a wide range of core areas in both disciplines which form the blocks of fundamental knowledge for further specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics, electrodynamics, linear algebra, mathematical analysis, abstract algebra, complex variables, differential equations, modern differential geometry, etc. A large selection of elective courses is provided for students to pursue a broad spectrum of professional knowledge in mathematical and theoretical physics. Analytical thinking, quantitative reasoning and innovative ideas are fostered through the effective design of courses and research projects. The curriculum emphasizes experiential learning through internships, field studies and research projects supervised by experts. With the comprehensive training received, graduates are expected to be well-prepared for further studies and to pursue careers in many fields of science and engineering.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with a rigorous representation using their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle physical problems with intellectual rigor theoretically (by means of coursework, tutorial classes and assessments in the curriculum)
- PLO 3: apply mathematical theory and techniques to analyze physical problems qualitatively and quantitatively, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-world setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Mathematics

Major in Physics

Minor in Computational & Financial Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits) SCNC1111 Scientific method and reasoning (6)

SCNC1111 Scientific method and reasoning (6)
SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6)
MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)
PHYS1250 Fundamental physics (6)
PHYS2265 Introductory quantum physics (6)

Disciplinary Electives (6 credits)

At least 6 credits selected from the following courses:
PHYS1150 Problem solving in physics (6)
PHYS2055 Introductory relativity (6)

PHYS2150 Methods in physics I (6)
PHYS2155 Methods in physics II (6)
PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)

PHYS2260 Heat and waves (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (36 credits) MATH3301 Algebra I (6)

MATH3401 Analysis I (6)
MATH4501 Geometry (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS4351 Advanced quantum mechanics (6)

Disciplinary Electives (6 credits)

At least 6 credits of advanced level Mathematics or Physics courses (MATH3XXX or MATH4XXX or MATH7XXX or PHYS3XXX or PHYS7XXX level), subject to prerequisite requirements. The current list of courses include courses in List A and those courses not selected to fulfill the capstone requirement, but excluding MATH4966 Mathematics Internship.

List A

MATH3001 Development of mathematical ideas (6)

MATHOOO	Mathematics seminar (6)	
MATH3002		
MATH3303	Matrix theory and its applications (6)	
MATH3304	Introduction to number theory (6)	
MATH3403	Functions of a complex variable (6)	
MATH3405	Differential equations (6)	
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MATH3408	Computational methods and differential equations with	
	applications (6)	
MATH3541	Introduction to topology (6)	
MATH3600	Discrete mathematics (6)	
MATH3601	Numerical analysis (6)	
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MATH3603	Probability theory (6)	
MATH3901	Operations research I (6)	
MATH3904	Introduction to optimization (6)	
MATH3905	Queueing theory and simulation (6)	
MATH3906	Financial calculus (6)	
MATH3911	Game theory and strategy (6)	
MATH3943	Network models in operations research (6)	
MATH4302	Algebra II (6)	
MATH4402	Analysis II (6)	
MATH4404	Functional analysis (6)	
MATH4406	Introduction to partial differential equations (6)	
MATH4511	Introduction to differentiable manifolds (6)	
MATH4602	Scientific computing (6)	
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MATH4902	Operations research II (6)	
MATH4907	Numerical methods for financial calculus (6)	
MATH7101	Intermediate complex analysis (6)	
MATH7201	Topics in geometry (6)	
MATH7202	Complex manifolds (6)	
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MATH7217	Topics in financial mathematics (6)	
MATH7219	Topics in applied functional analysis (6)	
MATH7224	Topics in advanced probability theory (6)	
MATH7501	Topics in algebra (6)	
MATH7502	Topics in applied discrete mathematics (6)	
MATH7503	Topics in mathematical programming and optimization (6)	
MATH7504	Geometric topology (6)	
MATH7505	Real analysis (6)	
PHYS3150	Theoretical physics (6)	
PHYS3151	Machine learning in physics (6)	
PHYS3450	Electromagnetism (6)	
PHYS3550	Statistical mechanics & thermodynamics (6)	
PHYS3551	Introductory solid state physics (6)	
PHYS3650	Observational astronomy (6)	
PHYS3651	The physical universe (6)	
PHYS3652	Principles of astronomy (6)	
PHYS3653	Astrophysics (6)	
PHYS3660	Astronomy laboratory (6)	
PHYS3750	Laser and spectroscopy (6)	
PHYS3751	Physics of nanomaterials (6)	
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PHYS3760	Physics laboratory (6)	
PHYS3850	Physical Optics (6)	[previous title: Waves and optics
		(6)]
PHYS3851	Atomic and nuclear physics (6)	
PHYS4150	Computational physics (6)	
PHYS4151	Data analysis and modeling in physics (6)	
PHYS4350	Advanced classical mechanics (6)	
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PHYS4450	Advanced electromagnetism (6)	
PHYS4550	Advanced statistical mechanics (6)	
PHYS4551	Solid state physics (6)	
PHYS4650	Stellar physics (6)	
PHYS4651	Selected topics in astrophysics (6)	
I II		
PHYS4652	Planetary science (6)	
PHYS4653	Cosmology (6)	
PHYS4654	General relativity (6)	
III FFI 1 3 4 0 3 4	General relativity (0)	
I II	, , ,	
PHYS4655	Interstellar medium (6)	
PHYS4655 PHYS4656	Interstellar medium (6) Advanced astrophysics (6)	
PHYS4655	Interstellar medium (6) Advanced astrophysics (6) Experimental physics (6)	
PHYS4655 PHYS4656	Interstellar medium (6) Advanced astrophysics (6)	
PHYS4655 PHYS4656 PHYS4750 PHYS4850	Interstellar medium (6) Advanced astrophysics (6) Experimental physics (6)	
PHYS4655 PHYS4656 PHYS4750 PHYS4850 PHYS7350	Interstellar medium (6) Advanced astrophysics (6) Experimental physics (6) Particle physics (6) Graduate classical mechanics (6)	
PHYS4655 PHYS4656 PHYS4750 PHYS4850 PHYS7350 PHYS7351	Interstellar medium (6) Advanced astrophysics (6) Experimental physics (6) Particle physics (6) Graduate classical mechanics (6) Graduate quantum mechanics (6)	
PHYS4655 PHYS4656 PHYS4750 PHYS4850 PHYS7350 PHYS7351 PHYS7450	Interstellar medium (6) Advanced astrophysics (6) Experimental physics (6) Particle physics (6) Graduate classical mechanics (6) Graduate quantum mechanics (6) Graduate electromagnetism (6)	
PHYS4655 PHYS4656 PHYS4750 PHYS4850 PHYS7350 PHYS7351	Interstellar medium (6) Advanced astrophysics (6) Experimental physics (6) Particle physics (6) Graduate classical mechanics (6) Graduate quantum mechanics (6) Graduate electromagnetism (6) Graduate statistical mechanics (6)	
PHYS4655 PHYS4656 PHYS4750 PHYS4850 PHYS7350 PHYS7351 PHYS7450	Interstellar medium (6) Advanced astrophysics (6) Experimental physics (6) Particle physics (6) Graduate classical mechanics (6) Graduate quantum mechanics (6) Graduate electromagnetism (6)	
PHYS4655 PHYS4656 PHYS4750 PHYS4850 PHYS7350 PHYS7351 PHYS7450 PHYS7550	Interstellar medium (6) Advanced astrophysics (6) Experimental physics (6) Particle physics (6) Graduate classical mechanics (6) Graduate quantum mechanics (6) Graduate electromagnetism (6) Graduate statistical mechanics (6)	
PHYS4655 PHYS4656 PHYS4750 PHYS4850 PHYS7350 PHYS7351 PHYS7450 PHYS7550 PHYS7551 PHYS7650	Interstellar medium (6) Advanced astrophysics (6) Experimental physics (6) Particle physics (6) Graduate classical mechanics (6) Graduate quantum mechanics (6) Graduate electromagnetism (6) Graduate statistical mechanics (6) Graduate solid state physics (6)	
PHYS4655 PHYS4656 PHYS4750 PHYS4850 PHYS7350 PHYS7351 PHYS7450 PHYS7550 PHYS7551 PHYS7650 PHYS7750	Interstellar medium (6) Advanced astrophysics (6) Experimental physics (6) Particle physics (6) Graduate classical mechanics (6) Graduate quantum mechanics (6) Graduate electromagnetism (6) Graduate statistical mechanics (6) Graduate solid state physics (6) Stellar atmospheres (6) Nanophysics (6)	
PHYS4655 PHYS4656 PHYS4750 PHYS4850 PHYS7350 PHYS7351 PHYS7450 PHYS7550 PHYS7551 PHYS7650	Interstellar medium (6) Advanced astrophysics (6) Experimental physics (6) Particle physics (6) Graduate classical mechanics (6) Graduate quantum mechanics (6) Graduate electromagnetism (6) Graduate statistical mechanics (6) Graduate solid state physics (6) Stellar atmospheres (6) Nanophysics (6)	

MATH3999 MATH4910 MATH4911 MATH4966 MATH4999 PHYS3999 PHYS4966	Directed studies in mathematics (6) Senior mathematics seminar (6) Mathematics capstone project (6) Mathematics internship (6) Mathematics project (12) Directed studies in physics (6) Physics internship (6)
	1 7 (/
PHYS4999	Physics project (12)

- 1. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 6. (a) Students must have level 3 or above in HKDSE Physics or HKDSE Combined Science with Physics component or equivalent to take this major. Students who do not fufill this requirement are advised to take PHYS1240 Physics by inquiry; and
- (b) Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fufill this requirement are advised to take MATH1011 University mathematics I.
- 7. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at http://www.scifac.hku.hk/ug/current/bsc/curriculum/overlapping-course-req.

Remarks:

Major Title Major in Mathematics/Physics

Offered to students 2015

admitted to Year 1 in

Objectives:

The Major in Mathematics/Physics aims to provide students with a solid foundation in both physics and mathematics. This major is catered especially for students interested in the more theoretical aspects of physics. It covers a wide range of core areas in both disciplines which form the blocks of fundamental knowledge for further specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics, electrodynamics, linear algebra, mathematical analysis, abstract algebra, complex variables, differential equations, modern differential geometry, etc. A large selection of elective courses is provided for students to pursue a broad spectrum of professional knowledge in mathematical and theoretical physics. Analytical thinking, quantitative reasoning and innovative ideas are fostered through the effective design of courses and research projects. The curriculum emphasizes experiential learning through internships, field studies and research projects supervised by experts. With the comprehensive training received, graduates are expected to be well-prepared for further studies and to pursue careers in many fields of science and engineering.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with a rigorous representation using their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle physical problems with intellectual rigor theoretically (by means of coursework, tutorial classes and assessments in the curriculum)
- PLO 3: apply mathematical theory and techniques to analyze physical problems qualitatively and quantitatively, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-world setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Mathematics

Major in Physics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)
SCNC1111 Scientific method and reasoning (6)
SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6)
MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)
PHYS1250 Fundamental physics (6)
PHYS2265 Introductory quantum physics (6)

Disciplinary Electives (6 credits)

At least 6 credits selected from the following courses:
PHYS1150 Problem solving in physics (6)
PHYS2055 Introductory relativity (6)
PHYS2150 Methods in physics I (6)
PHYS2155 Methods in physics II (6)
PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)

PHYS2260 Heat and waves (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (36 credits)

MATH3301 Algebra I (6)
MATH3401 Analysis I (6)
MATH4501 Geometry (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)

PHYS4351 Advanced quantum mechanics (6)

Disciplinary Electives (6 credits)

At least 6 credits of advanced level Mathematics or Physics courses (MATH3XXX or MATH4XXX or MATH7XXX or PHYS3XXX or PHYS7XXX level), subject to prerequisite requirements. The current list of courses include courses in List A and those courses not selected to fulfill the capstone requirement, but excluding MATH4966 Mathematics Internship.

List A

MATH3001 Development of mathematical ideas (6)

MATH3002 Mathematics seminar (6)

MATH3303	Matrix theory and its applications (6)	
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MATH3304	Introduction to number theory (6)	
MATH3403	Functions of a complex variable (6)	
MATH3405	Differential equations (6)	
MATH3408	Computational methods and differential equations with	
100 100	applications (6)	
MATH3541	Introduction to topology (6)	
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MATH3600	Discrete mathematics (6)	
MATH3601	Numerical analysis (6)	
MATH3603	Probability theory (6)	
MATH3901	Operations research I (6)	
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MATH3904	Introduction to optimization (6)	
MATH3905	Queueing theory and simulation (6)	
MATH3906	Financial calculus (6)	
MATH3911	Game theory and strategy (6)	
MATH3943	Network models in operations research (6)	
MATH4302	Algebra II (6)	
MATH4402	Analysis II (6)	
MATH4404	Functional analysis (6)	
	Introduction to partial differential equations (6)	
MATH4406	• • • • • • • • • • • • • • • • • • • •	
MATH4511	Introduction to differentiable manifolds (6)	
MATH4602	Scientific computing (6)	
MATH4902	Operations research II (6)	
MATH4907	Numerical methods for financial calculus (6)	
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MATH7101	Intermediate complex analysis (6)	
MATH7201	Topics in geometry (6)	
MATH7202	Complex manifolds (6)	
MATH7217	Topics in financial mathematics (6)	
MATH7219	Topics in applied functional analysis (6)	
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MATH7224	Topics in advanced probability theory (6)	
MATH7501	Topics in algebra (6)	
MATH7502	Topics in applied discrete mathematics (6)	
MATH7503	Topics in mathematical programming and optimization (6)	
MATH7504	Geometric topology (6)	
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MATH7505	Real analysis (6)	
PHYS3150	Theoretical physics (6)	
PHYS3151	Machine learning in physics (6)	
PHYS3450	Electromagnetism (6)	
PHYS3550	Statistical mechanics & thermodynamics (6)	
PHYS3551	Introductory solid state physics (6)	
PHYS3650	Observational astronomy (6)	
PHYS3651	The physical universe (6)	
PHYS3652	Principles of astronomy (6)	
PHYS3653	Astrophysics (6)	
PHYS3660	Astronomy laboratory (6)	
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PHYS3750	Laser and spectroscopy (6)	
PHYS3751	Physics of nanomaterials (6)	
PHYS3760	Physics laboratory (6)	
PHYS3850	Physical Optics (6)	[previous title: Waves and optics
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PHYS3851	Atomic and nuclear physics (6)	(9)]
PHYS4150	Computational physics (6)	
PHYS4151	Data analysis and modeling in physics (6)	
PHYS4350	Advanced classical mechanics (6)	
PHYS4450	Advanced electromagnetism (6)	
PHYS4550	Advanced statistical mechanics (6)	
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PHYS4551	Solid state physics (6)	
PHYS4650	Stellar physics (6)	
PHYS4651	Selected topics in astrophysics (6)	
PHYS4652	Planetary science (6)	
PHYS4653	Cosmology (6)	
PHYS4654	General relativity (6)	
PHYS4655	Interstellar medium (6)	
PHYS4656	Advanced astrophysics (6)	
PHYS4750	Experimental physics (6)	
PHYS4850	Particle physics (6)	
PHYS7350	Graduate classical mechanics (6)	
PHYS7351	Graduate quantum mechanics (6)	
PHYS7450	Graduate electromagnetism (6)	
PHYS7550	Graduate statistical mechanics (6)	
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PHYS7551	Graduate solid state physics (6)	
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PHYS7650	Stellar atmospheres (6)	
PHYS7650 PHYS7750	Nanophysics (6)	
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PHYS7650 PHYS7750	Nanophysics (6)	

MATH4910	Senior mathematics seminar (6)
MATH4911	Mathematics capstone project (6)
MATH4966	Mathematics internship (6)
MATH4999	Mathematics project (12)
PHYS3999	Directed studies in physics (6)
PHYS4966	Physics internship (6)
PHYS4999	Physics project (12)

- 1. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 6. (a) Students must have level 3 or above in HKDSE Physics or HKDSE Combined Science with Physics component or equivalent to take this major. Students who do not fufill this requirement are advised to take PHYS1240 Physics by inquiry; and
- (b) Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fufill this requirement are advised to take MATH1011 University mathematics I.
- 7. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at http://www.scifac.hku.hk/ug/current/bsc/curriculum/overlapping-course-req.

Remarks:

Major Title Major in Mathematics/Physics

Offered to students 2014

admitted to Year 1 in

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MATH3401 Analysis I (6)
MATH4501 Geometry (6)
PHYS3350 Classical mechanics (6)
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MATH3405 Differential equations (6)

MATH3408 Computational methods and differential equations with

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MATH3541 Introduction to topology (6)
MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)

MATH3603	Probability theory (6)	
MATH3901	Operations research I (6)	
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MATH3943	Network models in operations research (6)	
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MATH4402	Analysis II (6)	
MATH4404	Functional analysis (6)	
	Introduction to partial differential equations (6)	
MATH4406	• • • • • • • • • • • • • • • • • • • •	
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MATH4602	Scientific computing (6)	
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^{1.} Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. (a) Students must have level 3 or above in HKDSE Physics or HKDSE Combined Science with Physics component or equivalent to take this major. Students who do not fufill this requirement are advised to take PHYS1240 Physics by inquiry; and
- (b) Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fufill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at http://www.scifac.hku.hk/ug/current/bsc/curriculum/overlapping-course-req.

Remarks

Major Title Major in Mathematics/Physics

Offered to students 2013

admitted to Year 1 in

Objectives:

The Major in Mathematics/Physics aims to provide students with a solid foundation in both physics and mathematics. This major is catered especially for students interested in the more theoretical aspects of physics. It covers a wide range of core areas in both disciplines which form the blocks of fundamental knowledge for further specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics, electrodynamics, linear algebra, mathematical analysis, abstract algebra, complex variables, differential equations, modern differential geometry, etc. A large selection of elective courses is provided for students to pursue a broad spectrum of professional knowledge in mathematical and theoretical physics. Analytical thinking, quantitative reasoning and innovative ideas are fostered through the effective design of courses and research projects. The curriculum emphasizes experiential learning through internships, field studies and research projects supervised by experts. With the comprehensive training received, graduates are expected to be well-prepared for further studies and to pursue careers in many fields of science and engineering.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with a rigorous representation using their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle physical problems with intellectual rigor theoretically (by means of coursework, tutorial classes and assessments in the curriculum)
- PLO 3: apply mathematical theory and techniques to analyze physical problems qualitatively and quantitatively, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-world setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Mathematics

Major in Physics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)
SCNC1111 Scientific method and reasoning (6)
SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

MATH1013 University mathematics II (6)
MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)
PHYS1250 Fundamental physics (6)
PHYS2250 Introductory mechanics (6)
PHYS2265 Introductory quantum physics (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (36 credits)

MATH3301 Algebra I (6)
MATH3401 Analysis I (6)
MATH4501 Geometry (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS4351 Advanced quantum mechanics (6)

Disciplinary Electives (6 credits)

At least 6 credits of advanced level Mathematics or Physics courses (MATH3XXX or MATH4XXX or MATH7XXX or PHYS3XXX or PHYS7XXX level), subject to prerequisite requirements. The current list of courses include courses in List A and those courses not selected to fulfill the capstone requirement, but excluding MATH4966 Mathematics Internship.

List A

MATH3001 Development of mathematical ideas (6)

MATH3002 Mathematics seminar (6)

MATH3303 Matrix theory and its applications (6)
MATH3304 Introduction to number theory (6)
MATH3403 Functions of a complex variable (6)

MATH3405 Differential equations (6)

MATH3408 Computational methods and differential equations with

applications (6)

MATH3541 Introduction to topology (6)
MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)

MATH3603	Probability theory (6)	
MATH3901	Operations research I (6)	
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MATH3904	Introduction to optimization (6)	
MATH3905	Queueing theory and simulation (6)	
MATH3906	Financial calculus (6)	
MATH3911	Game theory and strategy (6)	
MATH3943	Network models in operations research (6)	
MATH4302	Algebra II (6)	
MATH4402	Analysis II (6)	
MATH4404	Functional analysis (6)	
	Introduction to partial differential equations (6)	
MATH4406	• • • • • • • • • • • • • • • • • • • •	
MATH4511	Introduction to differentiable manifolds (6)	
MATH4602	Scientific computing (6)	
MATH4902	Operations research II (6)	
MATH4907	Numerical methods for financial calculus (6)	
MATH7101	Intermediate complex analysis (6)	
MATH7201	Topics in geometry (6)	
MATH7202	Complex manifolds (6)	
MATH7217	Topics in financial mathematics (6)	
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MATH7219	Topics in applied functional analysis (6)	
MATH7224	Topics in advanced probability theory (6)	
MATH7501	Topics in algebra (6)	
MATH7502	Topics in applied discrete mathematics (6)	
MATH7503	Topics in mathematical programming and optimization (6)	
MATH7504	Geometric topology (6)	
MATH7505	Real analysis (6)	
PHYS3150	Theoretical physics (6)	
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PHYS3450	Electromagnetism (6)	
PHYS3550	Statistical mechanics & thermodynamics (6)	
PHYS3551	Introductory solid state physics (6)	
PHYS3650	Observational astronomy (6)	
PHYS3651	The physical universe (6)	
PHYS3652	Principles of astronomy (6)	
PHYS3750	Laser and spectroscopy (6)	
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	Physics of nanomaterials (6)	
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^{1.} Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 5. (a) Students must have level 3 or above in HKDSE Physics or HKDSE Combined Science with Physics component or equivalent to take this major. Students who do not fufill this requirement are advised to take PHYS1240 Physics by inquiry; and
- (b) Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fufill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at http://www.scifac.hku.hk/ug/current/bsc/curriculum/overlapping-course-req.

Remarks

Major Title Major in Mathematics/Physics

Offered to students 2012

admitted to Year 1 in

Objectives:

The Major in Mathematics/Physics aims to provide students with a solid foundation in both physics and mathematics. This major is catered especially for students interested in the more theoretical aspects of physics. It covers a wide range of core areas in both disciplines which form the blocks of fundamental knowledge for further specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics, electrodynamics, linear algebra, mathematical analysis, abstract algebra, complex variables, differential equations, modern differential geometry, etc. A large selection of elective courses is provided for students to pursue a broad spectrum of professional knowledge in mathematical and theoretical physics. Analytical thinking, quantitative reasoning and innovative ideas are fostered through the effective design of courses and research projects. The curriculum emphasizes experiential learning through internships, field studies and research projects supervised by experts. With the comprehensive training received, graduates are expected to be well-prepared for further studies and to pursue careers in many fields of science and engineering.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with a rigorous representation using their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle physical problems with intellectual rigor theoretically (by means of coursework, tutorial classes and assessments in the curriculum)
- PLO 3: apply mathematical theory and techniques to analyze physical problems qualitatively and quantitatively, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-world setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Mathematics Major in Physics Minor in Mathematics Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

MATH1013 University mathematics II (6)
MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)
PHYS1250 Fundamental physics (6)
PHYS2250 Introductory mechanics (6)
PHYS2265 Introductory quantum physics (6)

2. Advanced level courses (42 credits)

Disciplinary Core Courses (36 credits)

MATH3301 Algebra I (6)
MATH3401 Analysis I (6)
MATH4501 Geometry (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)

PHYS4351 Advanced quantum mechanics (6)

Disciplinary Electives (6 credits)

At least 6 credits of advanced level Mathematics or Physics courses (MATH3XXX or MATH4XXX or MATH7XXX or PHYS3XXX or PHYS7XXX level), subject to prerequisite requirements. The current list of courses include courses in List A and those courses not selected to fulfill the capstone requirement, but excluding MATH4966 Mathematics Internship.

List A

MATH3001 Development of mathematical ideas (6)

MATH3002 Mathematics seminar (6)

MATH3303 Matrix theory and its applications (6)
MATH3304 Introduction to number theory (6)
MATH3403 Functions of a complex variable (6)

MATH3405 Differential equations (6)

MATH3408 Computational methods and differential equations with

applications (6)

MATH3541 Introduction to topology (6)
MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3603 Probability theory (6)

MATH3901	Operations research I (6)	
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MATH3904	Introduction to optimization (6)	
MATH3905	Queueing theory and simulation (6)	
MATH3906	Financial calculus (6)	
MATH3911	Game theory and strategy (6)	
MATH3943	Network models in operations research (6)	
MATH4302	Algebra II (6)	
MATH4402	Analysis II (6)	
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MATH4404	Functional analysis (6)	
MATH4406	Introduction to partial differential equations (6)	
MATH4511	Introduction to differentiable manifolds (6)	
MATH4602	Scientific computing (6)	
MATH4902	Operations research II (6)	
MATH4907	Numerical methods for financial calculus (6)	
MATH7101	Intermediate complex analysis (6)	
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MATH7201	Topics in geometry (6)	
MATH7202	Complex manifolds (6)	
MATH7217	Topics in financial mathematics (6)	
MATH7219	Topics in applied functional analysis (6)	
MATH7224	Topics in advanced probability theory (6)	
MATH7501	Topics in algebra (6)	
	Topics in applied discrete mathematics (6)	
MATH7502	• • • • • • • • • • • • • • • • • • • •	
MATH7503	Topics in mathematical programming and optimization (6)	
MATH7504	Geometric topology (6)	
MATH7505	Real analysis (6)	
PHYS3150	Theoretical physics (6)	
PHYS3450	Electromagnetism (6)	
PHYS3550	Statistical mechanics & thermodynamics (6)	
PHYS3551	Introductory solid state physics (6)	
PHYS3650	Observational astronomy (6)	
PHYS3651	The physical universe (6)	
PHYS3652	Principles of astronomy (6)	
PHYS3750	Laser and spectroscopy (6)	
	Physics of nanomaterials (6)	
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^{1.} Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. (a) Students must have level 3 or above in HKDSE Physics or HKDSE Combined Science with Physics component or equivalent to take this major. Students who do not fufill this requirement are advised to take PHYS1240 Physics by inquiry; and
- (b) Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fufill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at http://www.scifac.hku.hk/ug/current/bsc/curriculum/overlapping-course-req.

Remarks:

Major Title Major in Molecular Biology & Biotechnology

2020

Offered to students

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major offers specialized training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop variousessential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences (Intensive)

Major in Molecular Biology & Biotechnology (Intensive)

Minor in Molecular Biology & Biotechnology

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

BIOL1110 From molecules to cells (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

BIOC2600 Basic biochemistry (6)

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)
BIOL2306 Ecology and evolution (6)

2. Advanced level courses (48 credits) Disciplinary Core Courses (24 credits)

BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (6)
BIOL4411 Plant and food biotechnology (6)
BIOL4415 Healthcare biotechnology (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3406 Reproduction and reproductive biotechnology (6)

BIOL3408 Genetics (6)

BIOL3508 Microbial physiology and biotechnology (6)
BIOL4401 Medical microbiology and applied immunology (6)

BIOL4409 General virology (6)

BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6) Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. ENVS4110 Environmental remediation (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3993 Directed studies in Molecular biology & biotechnology (6)

BIOL4963 Molecular biology & biotechnology internship (6) BIOL4993 Molecular biology & biotechnology project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Major Title Major in Molecular Biology & Biotechnology

2019

Offered to students

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major offers specialized training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop variousessential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences (Intensive)

Major in Molecular Biology & Biotechnology (Intensive)

Minor in Molecular Biology & Biotechnology

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

BIOL1110 From molecules to cells (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

BIOC2600 Basic biochemistry (6)

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)
BIOL2306 Ecology and evolution (6)

2. Advanced level courses (48 credits) Disciplinary Core Courses (24 credits)

BIOL3401 Molecular biology (6)
BIOL3402 Cell biology and cell technology (6)
BIOL4411 Plant and food biotechnology (6)

BIOL4411 Plant and food blotechnology (6)
BIOL4415 Healthcare biotechnology (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3406 Reproduction and reproductive biotechnology (6)

BIOL3408 Genetics (6)

BIOL3508 Microbial physiology and biotechnology (6)
BIOL4401 Medical microbiology and applied immunology (6)

BIOL4409 General virology (6)

BIOL4416 Stem cells and regenerative biology (6)
BIOL4417 'Omics' and systems biology (6)

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. ENVS4110 Environmental remediation (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3993 Directed studies in Molecular biology & biotechnology (6)

BIOL4963 Molecular biology & biotechnology internship (6) BIOL4993 Molecular biology & biotechnology project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Molecular Biology & Biotechnology

2018

Offered to students

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major offers specialized training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop variousessential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences (Intensive)

Major in Molecular Biology & Biotechnology (Intensive)

Minor in Molecular Biology & Biotechnology

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

BIOL1110 From molecules to cells (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

BIOC2600 Basic biochemistry (6)

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)
BIOL2306 Ecology and evolution (6)

2. Advanced level courses (48 credits) Disciplinary Core Courses (24 credits)

BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (6)
BIOL4411 Plant and food biotechnology (6)
BIOL4415 Healthcare biotechnology (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3406 Reproduction and reproductive biotechnology (6)

BIOL3408 Genetics (6)

BIOL3508 Microbial physiology and biotechnology (6)
BIOL4401 Medical microbiology and applied immunology (6)

BIOL4409 General virology (6)

BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6) Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. ENVS4110 Environmental remediation (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3993 Directed studies in Molecular biology & biotechnology (6)

BIOL4963 Molecular biology & biotechnology internship (6) BIOL4993 Molecular biology & biotechnology project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Molecular Biology & Biotechnology

2017

Offered to students

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major offers specialized training in state-ofthe-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop variousessential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)

Impermissible Combinations:

Major in Biological Sciences (Intensive)

Major in Molecular Biology & Biotechnology (Intensive)

Minor in Molecular Biology & Biotechnology

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

Scientific method and reasoning (6) SCNC1111 Fundamentals of modern science (6) SCNC1112

Disciplinary Core Courses (24 credits)

BIOL1110 From molecules to cells (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

Principles of biochemistry (6) **BIOL2220**

Basic biochemistry (6) BIOC2600

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6) **BIOL2306** Ecology and evolution (6)

2. Advanced level courses (48 credits) **Disciplinary Core Courses (30 credits)**

Molecular biology (6) BIOL3401

Cell biology and cell technology (6) BIOL3402 BIOL3508 Microbial physiology and biotechnology (6) BIOL4411 Plant and food biotechnology (6)

Healthcare biotechnology (6) **Disciplinary Electives (18 credits)**

BIOI 4415

At least 18 credits selected from the following courses:

Immunology (6) BIOL3403

BIOL3404 Protein structure and function (6)

BIOL3406 Reproduction and reproductive biotechnology (6)

Genetics (6) BIOL3408

Business aspects of biotechnology (6) BIOL3409

BIOL4401 Medical microbiology and applied immunology (6)

BIOL4409 General virology (6)

BIOL4416 Stem cells and regenerative biology (6) Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both.

BIOL4417 'Omics' and systems biology (6) ENVS4110 Environmental remediation (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3993 Directed studies in Molecular biology & biotechnology (6)

BIOL4963 Molecular biology & biotechnology internship (6) BIOL4993 Molecular biology & biotechnology project (12)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Molecular Biology & Biotechnology

Offered to students 2016

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major offers specialized training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop variousessential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)

Impermissible Combinations:

Major in Molecular Biology & Biotechnology (Intensive)

Minor in Molecular Biology & Biotechnology

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

BIOL1110 From molecules to cells (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

BIOC2600 Basic biochemistry (6)

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)
BIOL2306 Ecology and evolution (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (30 credits)

BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (6)
BIOL3508 Microbial physiology and biotechnology (6)
BIOL4411 Plant and food biotechnology (6)
BIOL4415 Healthcare biotechnology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3406 Reproduction and reproductive biotechnology (6)

BIOL3408 Genetics (6)

BIOL3409 Business aspects of biotechnology (6)

BIOL4401 Medical microbiology and applied immunology (6)

BIOL4409 General virology (6)

BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6) Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. ENVS4110 Environmental remediation (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3993 Directed studies in Molecular biology & biotechnology (6)

BIOL4963 Molecular biology & biotechnology internship (6) BIOL4993 Molecular biology & biotechnology project (12)

Notes:

1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.

- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Molecular Biology & Biotechnology

2015

Offered to students

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major offers specialized training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop variousessential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)

Impermissible Combinations:

Major in Molecular Biology & Biotechnology (Intensive)

Minor in Molecular Biology & Biotechnology

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

BIOL1110 From molecules to cells (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

Basic biochemistry (6)

BIOL2220 Principles of biochemistry (6)

Disciplinary Electives (6 credits)

BIOC2600

BIOL1309 Evolutionary diversity (6)
BIOL2306 Ecology and evolution (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (30 credits)

BIOL3401 Molecular biology (6)
BIOL3402 Cell biology and cell technology (6)

BIOL3508 Microbial physiology and biotechnology (6)

BIOL4402 Microbial biotechnology (6)

BIOL4411 Plant and food biotechnology (6)
BIOL4415 Healthcare biotechnology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)
BIOL3405 Molecular microbiology (6)

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both.

Take either BIOL3508 or BIOL4402 to fulfill this 30 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually

exclusive.

Take either BIOL3508 or BIOL4402 to fulfill this 30 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually

exclusive.

BIOL3406	Reproduction and reproductive biotechnology (6)
BIOL3408	Genetics (6)
BIOL3409	Business aspects of biotechnology (6)
BIOL4401	Medical microbiology and applied immunology (6)
BIOL4409	General virology (6)
BIOL4416	Stem cells and regenerative biology (6)
BIOL4417	'Omics' and systems biology (6)
ENVS4110	Environmental remediation (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3993 Directed studies in Molecular biology & biotechnology (6)
BIOL4963 Molecular biology & biotechnology internship (6)
BIOL4993 Molecular biology & biotechnology project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Molecular Biology & Biotechnology

Offered to students

2014 admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major offers specialized training in state-ofthe-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop variousessential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)

Impermissible Combinations:

Minor in Molecular Biology & Biotechnology

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

Scientific method and reasoning (6) SCNC1111 SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credit)

From molecules to cells (6) BIOL1110

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

Principles of biochemistry (6) **BIOL2220**

BIOC2600 Basic biochemistry (6)

Disciplinary Electives (6 credits)

Evolutionary diversity (6) BIOL1309

Ecology and evolution (6) **BIOL2306**

2. Advanced level courses (48 credits) **Disciplinary Core Courses (30 credits)**

BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (6) **BIOL3508** Microbial physiology and biotechnology (6)

BIOL4402 Microbial biotechnology (6)

BIOL4411 Plant and food biotechnology (6) **BIOL4415** Healthcare biotechnology (6)

Disciplinary Electives (18 credit)

At least 18 credits selected from the following courses:

Immunology (6) BIOL3403

BIOL3404 Protein structure and function (6) BIOL3405 Molecular microbiology (6)

Reproduction and reproductive biotechnology (6) **BIOL3406**

Take either BIOI 2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both.

Take either BIOL3508 or BIOL4402 to fulfill this 30 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.

Take either BIOL3508 or BIOL4402 to fulfill this 30 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.

1		
Ш	BIOL3408	Genetics (6)
Ш	BIOL3409	Business aspects of biotechnology (6)
Ш	BIOL4401	Medical microbiology and applied immunology (6)
Ш	BIOL4409	General virology (6)
Ш	BIOL4416	Stem cells and regenerative biology (6)
Ш	BIOL4417	'Omics' and systems biology (6)
Ш	ENVS4110	Environmental remediation (6)
Ш	3. Capstone requi	rement (6 credits)
Ш	At least 6 credits	s selected from the following courses:
Ш	BIOL3993	Directed studies in Molecular biology & biotechnology (6)
Ш	BIOL4963	Molecular biology & biotechnology internship (6)
Ш	BIOL4993	Molecular biology & biotechnology project (12)
Ш		

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Molecular Biology & Biotechnology

2013

Offered to students

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major offers specialized training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop variousessential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)

Impermissible Combinations:

Minor in Molecular Biology & Biotechnology

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

BIOL1110 From molecules to cells (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

BIOC2600 Basic biochemistry (6)

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)

BIOL2306 Ecology and evolution (6)

2. Advanced level courses (48 credits) Disciplinary Core Courses (30 credits)

BIOL3401 Molecular biology (6) BIOL3402 Cell biology and cell technology

BIOL3402 Cell biology and cell technology (6)
BIOL3508 Microbial physiology and biotechnology (6)

BIOL4402 Microbial biotechnology (6)

BIOL4411 Plant and food biotechnology (6)
BIOL4415 Healthcare biotechnology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6) BIOL3405 Molecular microbiology (6)

BIOL3406 Reproduction and reproductive biotechnology (6)

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both.

Take either BIOL3508 or BIOL4402 to fulfill this 30 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.

Take either BIOL3508 or BIOL4402 to fulfill this 30 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.

BIOL3408	Genetics (6)	
BIOL3409	Business aspects of biotechnology (6)	
BIOL4401	Medical microbiology and applied immunology (6)	
BIOL4409	General virology (6)	
BIOL4416	Stem cells and regenerative biology (6)	
BIOL4417	'Omics' and systems biology (6)	
ENVS4110	Environmental remediation (6)	
3. Capstone require	rement (6 credits)	
At least 6 credits	s selected from the following courses:	
BIOL3993	Directed studies in Molecular biology & biotechnology (6)	
BIOL4963	Molecular biology & biotechnology internship (6)	
BIOL4993	Molecular biology & biotechnology project (12)	

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Molecular Biology & Biotechnology

2012

Offered to students

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major offers specialized training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop variousessential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)

Impermissible Combinations:

Minor in Molecular Biology & Biotechnology

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

BIOL1110 From molecules to cells (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

BIOC2600 Basic biochemistry (6)

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)

BIOL2306 Ecology and evolution (6)

2. Advanced level courses (48 credits) Disciplinary Core Courses (30 credits)

BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (6)
BIOL3508 Microbial physiology and biotechnology (6)

BIOL4402 Microbial biotechnology (6)

BIOL4411 Plant and food biotechnology (6)
BIOL4415 Healthcare biotechnology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6) BIOL3405 Molecular microbiology (6)

BIOL3406 Reproduction and reproductive biotechnology (6)

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both. Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both.

Take either BIOL3508 or BIOL4402 to fulfill this 30 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.

Take either BIOL3508 or BIOL4402 to fulfill this 30 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.

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ı	BIOL3408	Genetics (6)
ı	BIOL3409	Business aspects of biotechnology (6)
ı	BIOL4401	Medical microbiology and applied immunology (6)
ı	BIOL4409	General virology (6)
ı	BIOL4416	Stem cells and regenerative biology (6)
ı	BIOL4417	'Omics' and systems biology (6)
ı	ENVS4110	Environmental remediation (6)
ı	3. Capstone requi	rement (6 credits)
ı	At least 6 credits	s selected from the following courses:
ı	BIOL3993	Directed studies in Molecular biology & biotechnology (6)
ı	BIOL4963	Molecular biology & biotechnology internship (6)
l	BIOL4993	Molecular biology & biotechnology project (12)
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- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.

Remarks:

Major Title Major in Molecular Biology & Biotechnology (Intensive)

2020

Offered to students

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major aims to provide comprehensive training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop various essential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

The intensive major involves additional coursework and research/capstone experience. It is designed for students with interest on a fuller scope of the discipline or planning to pursue research studies for a higher degree in any area of life science.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)
- PLO 6: equip with knowledges in chemistry, mathematics, statistics, or computer programming, with sufficient depth and breadth to apply these knowledges within a biological context (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 7: solve a scientific question empirically by designing and implementing experiments, learning new experimental skills and tackling experimental errors, reporting results unbiasedly and systematically (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

Major in Biological Sciences (Intensive)

Major in Molecular Biology & Biotechnology

Minor in Molecular Biology & Biotechnology

Required courses (144 credits)

Disciplinary Core	Courses: Science Foundation Courses (12 credits)
SCNC1111	Scientific method and reasoning (6)

SCNC1111 Scientific method and reasoning (6) (Note 1) SCNC1112 Fundamentals of modern science (6) (Note 1)

Disciplinary Core Courses (42 credits)

BIOL1110 From molecules to cells (6) (Note 1)
CHEM1042 General chemistry I (6)

CHEM1043 General chemistry II (6)
BIOL2102 Biostatistics (6) (Note 1)

BIOL2103 Biological sciences laboratory course (6) (Note 1)
BIOL2220 Principles of biochemistry (6) Take either BIOL2220 or BIOC2600 to fulfill

this 42 credits requirement, but not both.

BIOL2220 and BIOC2600 are mutually
exclusive. (Note 1)

BIOL2409 Biotechnology industry and entrepreneurship (6)

BIOC2600 Basic biochemistry (6) Take either BIOL2220 or BIOC2600 to fulfill this 42 credits requirement, but not both.

BIOL2220 and BIOC2600 are mutually

exclusive. (Note 1)

Disciplinary Electives (12 credits)

Plus at least 12 credits selected from the following courses:

BIOL1309 Evolutionary diversity (6)

May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.

BIOL2306 Ecology and evolution (6)

May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both. **BIOL2408** Green earth-plants and mankind (6) Computer programming (6) COMP1117 University mathematics I (6) MATH1011 University mathematics II (6) MATH1013 2. Advanced level courses (66 credits) **Disciplinary Core Courses (30 credits)** Molecular biology (6) (Note 1) BIOL3401 Cell biology and cell technology (6) (Note 1) BIOL3402 BIOL4411 Plant and food biotechnology (6) (Note 1) **BIOL4415** Healthcare biotechnology (6) (Note 1) **BIOL4417** 'Omics' and systems biology (6) **Disciplinary Electives (36 credits)** Plus at least 36 credits selected from the following courses: BIOL3205 Human physiology (6) BIOL3403 Immunology (6) Protein structure and function (6) BIOL3404 **BIOL3406** Reproduction and reproductive biotechnology (6) BIOL3408 Genetics (6) BIOL3508 Microbial physiology and biotechnology (6) ENVS3202 Plant physiology and climate change (6) Medical microbiology and applied immunology (6) BIOL4401 BIOL4409 General virology (6) Stem cells and regenerative biology (6) BIOL4416 ENVS4110 Environmental remediation (6)

Notes:

BIOL4993

1. These are core courses in the regular Molecular Biology and Biotechnology Major (96 credits) curriculum.

Molecular biology & biotechnology project (12)

- 2. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)

3. Capstone requirement (12 credits)

- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Major Title Major in Molecular Biology & Biotechnology (Intensive)

2019

Offered to students

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major aims to provide comprehensive training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop various essential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

The intensive major involves additional coursework and research/capstone experience. It is designed for students with interest on a fuller scope of the discipline or planning to pursue research studies for a higher degree in any area of life science.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)
- PLO 6: equip with knowledges in chemistry, mathematics, statistics, or computer programming, with sufficient depth and breadth to apply these knowledges within a biological context (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 7: solve a scientific question empirically by designing and implementing experiments, learning new experimental skills and tackling experimental errors, reporting results unbiasedly and systematically (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

BIOL2306

Ecology and evolution (6)

Major in Biological Sciences (Intensive)

Major in Molecular Biology & Biotechnology

Minor in Molecular Biology & Biotechnology

Required courses (144 credits) 1. Introductory level courses (66 credits) Disciplinary Core Courses: Science Foundation Courses (12 credits) Scientific method and reasoning (6) SCNC1111 (Note 1) Fundamentals of modern science (6) SCNC1112 (Note 1) **Disciplinary Core Courses (42 credits)** From molecules to cells (6) (Note 1) BIOL1110 General chemistry I (6) CHEM1042 General chemistry II (6) CHEM1043 Biostatistics (6) (Note 1) **BIOL2102** BIOL2103 Biological sciences laboratory course (6) (Note 1) **BIOL2220** Principles of biochemistry (6) Take either BIOL2220 or BIOC2600 to fulfill this 42 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1) **BIOL2409** Biotechnology industry and entrepreneurship (6) Basic biochemistry (6) **BIOC2600** Take either BIOL2220 or BIOC2600 to fulfill this 42 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1) **Disciplinary Electives (12 credits)** Plus at least 12 credits selected from the following courses: May take either BIOL1309 or BIOL2306 to Evolutionary diversity (6) **BIOI 1309**

fulfill this 12 credits requirement, but not both.

		May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.
BIOL2408	Green earth-plants and mankind (6)	runni uns 12 creans requirement, par not pour.
COMP1117	Computer programming (6)	
MATH1011	University mathematics I (6)	
MATH1013	University mathematics II (6)	
2. Advanced level	courses (66 credits)	
	Courses (30 credits)	
BIOL3401	Molecular biology (6)	(Note 1)
BIOL3402	Cell biology and cell technology (6)	(Note 1)
BIOL4411	Plant and food biotechnology (6)	(Note 1)
BIOL4415	Healthcare biotechnology (6)	(Note 1)
BIOL4417	'Omics' and systems biology (6)	
Disciplinary Elective	ves (36 credits)	
Plus at least 36 o	credits selected from the following courses:	
BIOL3107	Plant physiology (6)	Take either BIOL3107 or ENVS3202 to fulfill this 36 credits requirement, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL3205	Human physiology (6)	onoise of the second of the se
BIOL3403	Immunology (6)	
BIOL3404	Protein structure and function (6)	
BIOL3406	Reproduction and reproductive biotechnology (6)	
BIOL3408	Genetics (6)	
BIOL3508	Microbial physiology and biotechnology (6)	
ENVS3202	Plant physiology and climate change (6)	Take either BIOL3107 or ENVS3202 to fulfill this 36 credits requirement, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL4401	Medical microbiology and applied immunology (6)	
BIOL4409	General virology (6)	
BIOL4416	Stem cells and regenerative biology (6)	
ENVS4110	Environmental remediation (6)	
3. Capstone requir	rement (12 credits)	
BIOL4993	Molecular biology & biotechnology project (12)	

1. These are core courses in the regular Molecular Biology and Biotechnology Major (96 credits) curriculum.

Major Title Major in Molecular Biology & Biotechnology (Intensive)

2018

Offered to students

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major aims to provide comprehensive training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop various essential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

The intensive major involves additional coursework and research/capstone experience. It is designed for students with interest on a fuller scope of the discipline or planning to pursue research studies for a higher degree in any area of life science.

This intensive major has been accredited by the Royal Society of Biology (RSB), UK, for the purpose of meeting in part the academic and experience requirement for the Membership and Chartered Biologist (CBiol).

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)
- PLO 6: equip with knowledges in chemistry, mathematics, statistics, or computer programming, with sufficient depth and breadth to apply these knowledges within a biological context (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 7: solve a scientific question empirically by designing and implementing experiments, learning new experimental skills and tackling experimental errors, reporting results unbiasedly and systematically (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

Major in Biological Sciences (Intensive)

Major in Molecular Biology & Biotechnology

Minor in Molecular Biology & Biotechnology

Required courses (144 credits)

1. Introductory level courses (66 credits)
Disciplinary Core Courses: Science Foundation Courses (12 credits)

		,
SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)

Disciplinary Core Courses (42 credits)

From molecules to cells (6) (Note 1) **BIOI 1110**

General chemistry I (6) CHEM1042 General chemistry II (6) CHEM1043

Biostatistics (6) (Note 1) BIOL2102 BIOL2103 Biological sciences laboratory course (6) (Note 1) Take either BIOL2220 or BIOC2600 to fulfill

BIOL2220 Principles of biochemistry (6) this 42 credits requirement, but not both.

Biotechnology industry and entrepreneurship (6) **BIOL2409**

Basic biochemistry (6) **BIOC2600**

Take either BIOL2220 or BIOC2600 to fulfill this 42 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1)

Disciplinary Electives (12 credits)

Plus at least 12 credits selected from the following courses:

Evolutionary diversity (6) **BIOL1309**

BIOL2306 Ecology and evolution (6) May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.

BIOL2220 and BIOC2600 are mutually

exclusive. (Note 1)

		May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.
BIOL2408	Green earth-plants and mankind (6)	runni uns 12 creans requirement, par not pour.
COMP1117	Computer programming (6)	
MATH1011	University mathematics I (6)	
MATH1013	University mathematics II (6)	
2. Advanced level	courses (66 credits)	
	Courses (30 credits)	
BIOL3401	Molecular biology (6)	(Note 1)
BIOL3402	Cell biology and cell technology (6)	(Note 1)
BIOL4411	Plant and food biotechnology (6)	(Note 1)
BIOL4415	Healthcare biotechnology (6)	(Note 1)
BIOL4417	'Omics' and systems biology (6)	
Disciplinary Elective	ves (36 credits)	
Plus at least 36 o	credits selected from the following courses:	
BIOL3107	Plant physiology (6)	Take either BIOL3107 or ENVS3202 to fulfill this 36 credits requirement, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL3205	Human physiology (6)	onoise of the second of the se
BIOL3403	Immunology (6)	
BIOL3404	Protein structure and function (6)	
BIOL3406	Reproduction and reproductive biotechnology (6)	
BIOL3408	Genetics (6)	
BIOL3508	Microbial physiology and biotechnology (6)	
ENVS3202	Plant physiology and climate change (6)	Take either BIOL3107 or ENVS3202 to fulfill this 36 credits requirement, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL4401	Medical microbiology and applied immunology (6)	
BIOL4409	General virology (6)	
BIOL4416	Stem cells and regenerative biology (6)	
ENVS4110	Environmental remediation (6)	
3. Capstone requir	rement (12 credits)	
BIOL4993	Molecular biology & biotechnology project (12)	

1. These are core courses in the regular Molecular Biology and Biotechnology Major (96 credits) curriculum.

Major Title Major in Molecular Biology & Biotechnology (Intensive)

2017

Offered to students

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major aims to provide comprehensive training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop various essential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

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Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)
- PLO 6: equip with knowledges in chemistry, mathematics, statistics, or computer programming, with sufficient depth and breadth to apply these knowledges within a biological context (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 7: solve a scientific question empirically by designing and implementing experiments, learning new experimental skills and tackling experimental errors, reporting results unbiasedly and systematically (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

BIOL1309

BIOL2306

Major in Biological Sciences (Intensive)

Major in Molecular Biology & Biotechnology

Minor in Molecular Biology & Biotechnology

Evolutionary diversity (6)

Ecology and evolution (6)

Required courses (144 credits) 1. Introductory level courses (66 credits) Disciplinary Core Courses: Science Foundation Courses (12 credits) Scientific method and reasoning (6) SCNC1111 (Note 1) Fundamentals of modern science (6) SCNC1112 (Note 1) **Disciplinary Core Courses (42 credits)** From molecules to cells (6) (Note 1) BIOL1110 General chemistry I (6) CHEM1042 General chemistry II (6) CHEM1043 Biostatistics (6) (Note 1) **BIOL2102** BIOL2103 Biological sciences laboratory course (6) (Note 1) BIOL2220 Principles of biochemistry (6) Take either BIOL2220 or BIOC2600 to fulfill this 42 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1) Biotechnology industry and entrepreneurship (6) **BIOL2409 BIOC2600** Basic biochemistry (6) Take either BIOL2220 or BIOC2600 to fulfill this 42 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1) **Disciplinary Electives (12 credits)** Plus at least 12 credits selected from the following courses:

May take either BIOL1309 or BIOL2306 to

fulfill this 12 credits requirement, but not both.

		May take either BIOL 1309 or BIOL 2306 to fulfill this 12 credits requirement, but not both.
BIOL2408	Green earth-plants and mankind (6)	rumii tins 12 creatis requirement, but not boti.
COMP1117	Computer programming (6)	
MATH1011	University mathematics I (6)	
MATH1013	University mathematics II (6)	
2. Advanced level co	ourses (66 credits)	
Disciplinary Core Co	ourses (30 credits)	
BIOL3401	Molecular biology (6)	(Note 1)
BIOL3402	Cell biology and cell technology (6)	(Note 1)
BIOL4411	Plant and food biotechnology (6)	(Note 1)
BIOL4415	Healthcare biotechnology (6)	(Note 1)
BIOL4417	'Omics' and systems biology (6)	
Disciplinary Elective	` ,	
	edits selected from the following courses:	
BIOL3107	Plant physiology (6)	Take either BIOL3107 or ENVS3202 to fulfill this 36 credits requirement, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL3205	Human physiology (6)	oxolasive:
BIOL3403	Immunology (6)	
BIOL3404	Protein structure and function (6)	
BIOL3406	Reproduction and reproductive biotechnology (6)	
BIOL3408	Genetics (6)	
BIOL3508	Microbial physiology and biotechnology (6)	
ENVS3202	Plant physiology and climate change (6)	Take either BIOL3107 or ENVS3202 to fulfill this 36 credits requirement, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL4401	Medical microbiology and applied immunology (6)	•
BIOL4409	General virology (6)	
BIOL4416	Stem cells and regenerative biology (6)	
ENVS4110	Environmental remediation (6)	
3. Capstone require		
BIOL4993	Molecular biology & biotechnology project (12)	

1. These are core courses in the regular Molecular Biology and Biotechnology Major (96 credits) curriculum.

Major Title Major in Molecular Biology & Biotechnology (Intensive)

2016

Offered to students

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major aims to provide comprehensive training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop various essential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

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Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)
- PLO 6: equip with knowledges in chemistry, mathematics, statistics, or computer programming, with sufficient depth and breadth to apply these knowledges within a biological context (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 7: solve a scientific question empirically by designing and implementing experiments, learning new experimental skills and tackling experimental errors, reporting results unbiasedly and systematically (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

Major in Molecular Biology & Biotechnology

Minor in Molecular Biology & Biotechnology				
Required courses (144 credits)				
1. Introductory lev	1. Introductory level courses (66 credits)			
Disciplinary Core (Disciplinary Core Courses: Science Foundation Courses (12 credits)			
SCNC1111	Scientific method and reasoning (6)	(Note 1)		
SCNC1112	Fundamentals of modern science (6)	(Note 1)		
Disciplinary Core Courses (42 credits)				
BIOL1110	From molecules to cells (6)	(Note 1)		
CHEM1042	General chemistry I (6)			
CHEM1043	General chemistry II (6)			
BIOL2102	Biostatistics (6)	(Note 1)		
BIOL2103	Biological sciences laboratory course (6)	(Note 1)		
BIOL2220	Principles of biochemistry (6)	Take either BIOL2220 or BIOC2600 to fulfill		
		this 42 credits requirement, but not both.		
		BIOL2220 and BIOC2600 are mutually		
DIOI 0400	Districts of the state of the s	exclusive. (Note 1)		
BIOL2409	Biotechnology industry and entrepreneurship (6)	T / '// BIOLOGO BIOCOCO / (/////		
BIOC2600	Basic biochemistry (6)	Take either BIOL2220 or BIOC2600 to fulfill		
		this 42 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually		
		exclusive. (Note 1)		
Disciplinary Elective	ves (12 credits)	excise (ricio 1)		
Plus at least 12 credits selected from the following courses:				
BIOL1309	Evolutionary diversity (6)	May take either BIOL1309 or BIOL2306 to		
	• • • • • • • • • • • • • • • • • • • •	fulfill this 12 credits requirement, but not both.		
BIOL2306	Ecology and evolution (6)	May take either BIOL1309 or BIOL2306 to		
		fulfill this 12 credits requirement, but not both.		

BIOL2408	Green earth-plants and mankind (6)	
COMP1117	Computer programming (6)	
MATH1011	University mathematics I (6)	
MATH1013	University mathematics II (6)	
2. Advanced level	courses (66 credits)	
Disciplinary Core	Courses (30 credits)	
BIOL3401	Molecular biology (6)	(Note 1)
BIOL3402	Cell biology and cell technology (6)	(Note 1)
BIOL4411	Plant and food biotechnology (6)	(Note 1)
BIOL4415	Healthcare biotechnology (6)	(Note 1)
BIOL4417	'Omics' and systems biology (6)	
Disciplinary Electi	ves (36 credits)	
Plus at least 36 o	credits selected from the following courses:	
BIOL3107	Plant physiology (6)	Take either BIOL3107 or ENVS3202 to fulfill this 36 credits requirement, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL3205	Human physiology (6)	
BIOL3403	Immunology (6)	
BIOL3404	Protein structure and function (6)	
BIOL3406	Reproduction and reproductive biotechnology (6)	
BIOL3408	Genetics (6)	
BIOL3508	Microbial physiology and biotechnology (6)	
ENVS3202	Plant physiology and climate change (6)	Take either BIOL3107 or ENVS3202 to fulfill this 36 credits requirement, but not both. BIOL3107 and ENVS3202 are mutually exclusive.
BIOL4401	Medical microbiology and applied immunology (6)	5.0.6.5170.
BIOL4409	General virology (6)	
BIOL4416	Stem cells and regenerative biology (6)	
ENVS4110	Environmental remediation (6)	
	rement (12 credits)	
BIOL4993	Molecular biology & biotechnology project (12)	

1. These are core courses in the regular Molecular Biology and Biotechnology Major (96 credits) curriculum.

Major Title Major in Molecular Biology & Biotechnology (Intensive)

Offered to students 2015

admitted to Year 1 in

Objectives:

Recent advancements in Molecular Biology & Biotechnology have not only cracked important and fundamental problems in life sciences, but also emerged as a mainstay of science and technologies of the 21st century. Innovations from advances in these fields have substantially transformed our daily lives, society and environment. This Major aims to provide comprehensive training in state-of-the-art molecular and cell biology, and in the translation of basic knowledge into modern industrial and medical applications. Students will be able to gain an understanding of cutting edge molecular biology and biotechnological applications, ranging from exploitation of bioactive substances, genetic engineering for agricultural production, fisheries and aquaculture, biomedical researches for pharmaceutical and clinical purposes, biofuels as alternative energy sources, bioremediation for cleaning up contaminated environments, and wastewater treatment. Built upon a sound theoretical foundation, students will further develop various essential skills in molecular biology and biotechnology through hands-on laboratory trainings and experimental biology-based projects. A feature of this major is to provide key transferable skills by engaging students in inquiry, critical thinking, and problem solving in their learning.

The intensive major involves additional coursework and research/capstone experience. It is designed for students with interest on a fuller scope of the discipline or planning to pursue research studies for a higher degree in any area of life science.

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Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe key concepts in molecular biology and modern biotechnology using knowledge from cell biology, microbiology, biochemistry, immunology, omics and systems biology (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 2: apply laboratory techniques essential to modern molecular science (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 3: communicate in written and oral communication skills and collaborate with other students effectively (by means of coursework, research-based learning and presentation opportunities in the curriculum)
- PLO 4: acquire scientific inquiry and critical thinking skills, including the ability to understand, analyze, and evaluate debated problems in the field and develop solutions, and appraise the related ethical issues (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 5: gain insights into real-life experience in the applications of biotechnology for human health, agriculture, and the environment (by means of coursework, laboratory-based and experiential learning in the curriculum)
- PLO 6: equip with knowledges in chemistry, mathematics, statistics, or computer programming, with sufficient depth and breadth to apply these knowledges within a biological context (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)
- PLO 7: solve a scientific question empirically by designing and implementing experiments, learning new experimental skills and tackling experimental errors, reporting results unbiasedly and systematically (by means of coursework and laboratory-based and/or research-based opportunities in the curriculum)

Impermissible Combinations:

Major in Biological Sciences

BIOL2306

Ecology and evolution (6)

Major in Molecular Biology & Biotechnology

Minor in Molecular Biology & Biotechnology

Required courses	s (144 credits)	
1. Introductory lev	vel courses (66 credits)	
Disciplinary Core	Courses: Science Foundation Courses (12 credits)	
SCNC1111	Scientific method and reasoning (6)	(Note 1)
SCNC1112	Fundamentals of modern science (6)	(Note 1)
Disciplinary Core	Courses (42 credits)	
BIOL1110	From molecules to cells (6)	(Note 1)
CHEM1042	General chemistry I (6)	
CHEM1043	General chemistry II (6)	
BIOL2102	Biostatistics (6)	(Note 1)
BIOL2103	Biological sciences laboratory course (6)	(Note 1)
BIOL2220	Principles of biochemistry (6)	Take either BIOL2220 or BIOC2600 to fulfill this 42 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1)
BIOL2409	Biotechnology industry and entrepreneurship (6)	
BIOC2600	Basic biochemistry (6)	Take either BIOL2220 or BIOC2600 to fulfill this 42 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive. (Note 1)
Disciplinary Electi	ives (12 credits)	
Plus at least 12	credits selected from the following courses:	
BIOL1309	Evolutionary diversity (6)	May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.

May take either BIOL1309 or BIOL2306 to

fulfill this 12 credits requirement, but not both.

DIOI 2400	Cross sorth plants and mankind (6)		
BIOL2408 COMP1117	Green earth-plants and mankind (6) Computer programming (6)		
	University mathematics I (6)		
MATH1011	. ,		
MATH1013	University mathematics II (6)		
	courses (66 credits)		
	Courses (30 credits)	(Nata d)	
BIOL3401	Molecular biology (6)	(Note 1)	
BIOL3402	Cell biology and cell technology (6)	(Note 1)	
BIOL4411	Plant and food biotechnology (6)	(Note 1)	
BIOL4415	6, ()	(Note 1)	
BIOL4417	'Omics' and systems biology (6)		
Disciplinary Electi			
	credits selected from the following courses:		
BIOL3107	Plant physiology (6)		
BIOL3205	Human physiology (6)		
BIOL3403	Immunology (6)		
BIOL3404	Protein structure and function (6)		
BIOL3406	Reproduction and reproductive biotechnology (6)		
BIOL3408	Genetics (6)		
BIOL3508	Microbial physiology and biotechnology (6)		
BIOL4401	Medical microbiology and applied immunology (6)		
BIOL4409	General virology (6)		
BIOL4416	Stem cells and regenerative biology (6)		
ENVS4110	Environmental remediation (6)		
3. Capstone require	rement (12 credits)		
BIOL4993	Molecular biology & biotechnology project (12)		

1. These are core courses in the regular Molecular Biology and Biotechnology Major (96 credits) curriculum.

Remarks:

Major Title Major in Physics

Offered to students 2020

admitted to Year 1 in

Objectives:

The Major in Physics aims to provide students with a solid foundation on the subject. Core courses form the blocks of fundamental knowledge to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge in physics, research experience and the training of analytical thinking and quantitative reasoning during their studies. Graduates are expected to have acquired the broad training which can equip them well for further studies in multiple science and technology disciplines and to work in their specialized area.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle problems either theoretical or experimental in nature (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: analyze problems qualitatively and quantitatively, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate effectively with people of different background, culture, gender and nationality in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-word setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Physics (Intensive)

Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6)

SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)
PHYS2261 Introductory heat and thermodynamics (6)
PHYS2265 Introductory quantum physics (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

PHYS1150 Problem solving in physics (6)
PHYS2055 Introductory relativity (6)
PHYS2150 Methods in physics I (6)
PHYS2155 Methods in physics II (6)

PHYS2160 Introductory computational physics (6)

2. Advanced level courses (42 credits)

Disciplinary Electives (42credits)

At least 24 credits selected from courses in List A:

List A

PHYS3150 Theoretical physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3760 Physics laboratory (6)

Plus at least 18 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in Lists A and B and those courses not selected to fulfill the capstone requirements.

List B

PHYS3151 Machine learning in physics (6)
PHYS3650 Observational astronomy (6)

PHYS3653 Astrophysics (6) PHYS3660 Astronomy laboratory (6)

PHYS3750 Laser and spectroscopy (6)
PHYS3850 Physical Optics (6)

PHYS3851 Atomic and nuclear physics (6)
PHYS4150 Computational physics (6)

PHYS4151 Data analysis and modeling in physics (6)
PHYS4351 Advanced quantum mechanics (6)
PHYS4450 Advanced electromagnetism (6)
PHYS4550 Advanced statistical mechanics (6)

Solid state physics (6) PHYS4551 Stellar physics (6) **PHYS4650** Planetary science (6) PHYS4652 PHYS4653 Cosmology (6) **PHYS4654** General relativity (6) **PHYS4655** Interstellar medium (6) Advanced astrophysics (6) **PHYS4656** PHYS4850 Particle physics (6)

PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)
PHYS7450 Graduate electromagnetism (6)
PHYS7550 Graduate statistical mechanics (6)

PHYS7750 Nanophysics (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

PHYS3999 Directed studies in physics (6) PHYS4966 Physics internship (6)

PHYS4999 Physics project (12)

Notes:

Notes:

- 1. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.
- 6. Those who want to specialize in the astrophysics theme should pass any three of the following courses: PHYS3650 Observational astronomy, PHYS3653 Astrophysics, PHYS3660 Astronomy laboratory, PHYS4652 Planetary science, PHYS4653 Cosmology, PHYS4654 General relativity, PHYS4655 Interstellar medium, and PHYS4656 Advanced astrophysics, out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in astrophysics.
- 7. Those who want to specialize in the computational physics theme should pass any three of the following courses: PHYS3150 Theoretical physics, PHYS3151 Machine learning in physics, PHYS4150 Computational physics, and PHYS4151 Data analysis and modeling in physics out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in computational physics.
- 8. Those who want to specialize in the experimental physics theme should pass PHYS3760 Physics laboratory, plus any two of the following courses: PHYS3660 Astronomy laboratory, PHYS3750 Laser and spectroscopy, PHYS3850 Physical optics, PHYS3851 Atomic and nuclear physics, PHYS4151 Data analysis and modeling in physics, PHYS4551 Solid state physics, and PHYS4850 Particle physics out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in experimental physics.
- 9. Those who want to specialize in the theoretical physics theme should pass any four of the following courses: PHYS3150 Theoretical physics, PHYS3350 Classical mechanics, PHYS3351 Quantum mechanics, PHYS3450 Electromagnetism, PHYS3550 Statistical mechanics & thermodynamics, PHYS4351 Advanced quantum mechanics, PHYS4450 Advanced electromagnetism, PHYS4551 Solid state physics, PHYS4654 General relativity, PHYS4850 Particle physics, PHYS7351 Graduate quantum mechanics, PHYS7450 Graduate electromagnetism, PHYS7550 Graduate statistical mechanics out of which at least two must be 4000+ level courses, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in theoretical physics.
- 10. Upon prior approval, one may use PHYS4966 Physics internship to replace PHYS3999 Directed studies or PHYS4999 Physics project to fulfill the specialization in a theme.
- 11. No double counting is allowed if one wants to specialize in more than one theme. In this case, one is allowed to replace the PHYS3999 Directed studies in physics or PHYS4999 Physics project requirement in one of the theme specializations by a regular course in the same theme of specialization.
- 12. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled.

Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Major Title Major in Physics

Offered to students 2019

admitted to Year 1 in

Objectives:

The Major in Physics aims to provide students with a solid foundation on the subject. Core courses form the blocks of fundamental knowledge to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge in physics, research experience and the training of analytical thinking and quantitative reasoning during their studies. Graduates are expected to have acquired the broad training which can equip them well for further studies in multiple science and technology disciplines and to work in their specialized area.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle problems either theoretical or experimental in nature (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: analyze problems qualitatively and quantitatively, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate effectively with people of different background, culture, gender and nationality in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-word setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Physics (Intensive)

Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)
PHYS2261 Introductory heat and thermodynamics (6)
PHYS2265 Introductory quantum physics (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:
PHYS1150 Problem solving in physics (6)
PHYS2055 Introductory relativity (6)
PHYS2150 Methods in physics I (6)
PHYS2155 Methods in physics II (6)

PHYS2160 Introductory computational physics (6)

2. Advanced level courses (42 credits)

Disciplinary Electives (42credits)

At least 24 credits selected from courses in List A:

List A

PHYS3150 Theoretical physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3760 Physics laboratory (6)

Plus at least 18 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in Lists A and B and those courses not selected to fulfill the capstone requirements.

List B

PHYS3151 Machine learning in physics (6) PHYS3650 Observational astronomy (6)

PHYS3653 Astrophysics (6) PHYS3660 Astronomy laboratory (6)

PHYS3750 Astronomy laboratory (6)

Laser and spectroscopy (6)

PHYS3850 Physical Optics (6) [previous title: Waves and optics (6)]

PHYS3851 Atomic and nuclear physics (6)

PHYS4150 Computational physics (6)
PHYS4151 Data analysis and modeling i

PHYS4151 Data analysis and modeling in physics (6)
PHYS4351 Advanced quantum mechanics (6)
PHYS4450 Advanced electromagnetism (6)
PHYS4550 Advanced statistical mechanics (6)

PHYS4551	Solid state physics (6)
PHYS4650	Stellar physics (6)
PHYS4652	Planetary science (6)
PHYS4653	Cosmology (6)
PHYS4654	General relativity (6)
PHYS4655	Interstellar medium (6)
PHYS4656	Advanced astrophysics (6)
PHYS4850	Particle physics (6)
PHYS7350	Graduate classical mechanics (6)
PHYS7351	Graduate quantum mechanics (6)
PHYS7450	Graduate electromagnetism (6)
PHYS7550	Graduate statistical mechanics (6)

PHYS7750 Nanophysics (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses: PHYS3999 Directed studies in physics (6)

PHYS4966 Physics internship (6) PHYS4999 Physics project (12)

Notes:

Notes:

- 1. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
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- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 6. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.
- 7. Those who want to specialize in the astrophysics theme should pass any three of the following courses: PHYS3650 Observational astronomy, PHYS3653 Astrophysics, PHYS3660 Astronomy laboratory, PHYS4652 Planetary science, PHYS4653 Cosmology, PHYS4654 General relativity, PHYS4655 Interstellar medium, and PHYS4656 Advanced astrophysics, out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in astrophysics.
- 8. Those who want to specialize in the computational physics theme should pass any three of the following courses: PHYS3150 Theoretical physics, PHYS3151 Machine learning in physics, PHYS4150 Computational physics, and PHYS4151 Data analysis and modeling in physics out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in computational physics.
- 9. Those who want to specialize in the experimental physics theme should pass PHYS3760 Physics laboratory, plus any two of the following courses: PHYS3660 Astronomy laboratory, PHYS3750 Laser and spectroscopy, PHYS3850 Physical optics, PHYS3851 Atomic and nuclear physics, PHYS4151 Data analysis and modeling in physics, PHYS4551 Solid state physics, and PHYS4850 Particle physics out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in experimental physics.
- 10. Those who want to specialize in the theoretical physics theme should pass any four of the following courses: PHYS3150 Theoretical physics, PHYS3350 Classical mechanics, PHYS3351 Quantum mechanics, PHYS3450 Electromagnetism, PHYS3550 Statistical mechanics & thermodynamics, PHYS4351 Advanced quantum mechanics, PHYS450 Advanced electromagnetism, PHYS4551 Solid state physics, PHYS4654 General relativity, PHYS4850 Particle physics, PHYS7351 Graduate quantum mechanics, PHYS7450 Graduate electromagnetism, PHYS7550 Graduate statistical mechanics out of which at least two must be 4000+ level courses, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in theoretical physics.
- 11. Upon prior approval, one may use PHYS4966 Physics internship to replace PHYS3999 Directed studies or PHYS4999 Physics project to fulfill the specialization in a theme.
- 12. No double counting is allowed if one wants to specialize in more than one theme. In this case, one is allowed to replace the PHYS3999 Directed studies in physics or PHYS4999 Physics project requirement in one of the theme specializations by a regular course in the same theme of specialization.

Remarks:

Major Title Major in Physics

Offered to students 2018

admitted to Year 1 in

Objectives:

The Major in Physics aims to provide students with a solid foundation on the subject. Core courses form the blocks of fundamental knowledge to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge in physics, research experience and the training of analytical thinking and quantitative reasoning during their studies. Graduates are expected to have acquired the broad training which can equip them well for further studies in multiple science and technology disciplines and to work in their specialized area.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle problems either theoretical or experimental in nature (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: analyze problems qualitatively and quantitatively, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate effectively with people of different background, culture, gender and nationality in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-word setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Physics (Intensive)

Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (24 credits)

PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)
PHYS2261 Introductory heat and thermodynamics (6)

PHYS2265 Introductory quantum physics (6) [previous title: Modern physics (6)]

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: PHYS1150 Problem solving in physics (6)

PHYS2055 Introductory relativity (6) [previous title: Introduction to relativity (6) [6]

PHYS2150 Methods in physics I (6) PHYS2155 Methods in physics II (6)

PHYS2160 Introductory computational physics (6)

2. Advanced level courses (42 credits)

Disciplinary Electives (42credits)

At least 24 credits selected from courses in List A:

List A

PHYS3150 Theoretical physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3760 Physics laboratory (6)

Plus at least 18 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in Lists A and B and those courses not selected to fulfill the capstone requirements.

List B

PHYS3151 Machine learning in physics (6)
PHYS3650 Observational astronomy (6)
PHYS3653 Astrophysics (6)

PHYS3660 Astronomy laboratory (6)
PHYS3750 Laser and spectroscopy (6)
PHYS3850 Physical Optics (6)

PHYS3851 Atomic and nuclear physics (6) PHYS4150 Computational physics (6)

PHYS4151 Data analysis and modeling in physics (6)
PHYS4351 Advanced quantum mechanics (6)
PHYS4450 Advanced electromagnetism (6)
PHYS4550 Advanced statistical mechanics (6)

[previous title: Waves and optics (6)]

PHYS4551	Solid state physics (6)
PHYS4650	Stellar physics (6)
PHYS4652	Planetary science (6)
PHYS4653	Cosmology (6)
PHYS4654	General relativity (6)
PHYS4655	Interstellar medium (6)
PHYS4656	Advanced astrophysics (6)
PHYS4850	Particle physics (6)
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PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)
PHYS7450 Graduate electromagnetism (6)
PHYS7550 Graduate statistical mechanics (6)

PHYS7750 Nanophysics (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
PHYS3999 Directed studies in physics (6)
PHYS4966 Physics internship (6)
PHYS4999 Physics project (12)

Notes:

Notes:

- 1. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 6. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.
- 7. Those who want to specialize in the astrophysics theme should pass any three of the following courses: PHYS3650 Observational astronomy, PHYS3653 Astrophysics, PHYS3660 Astronomy laboratory, PHYS4652 Planetary science, PHYS4653 Cosmology, PHYS4654 General relativity, PHYS4655 Interstellar medium, and PHYS4656 Advanced astrophysics, out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in astrophysics.
- 8. Those who want to specialize in the computational physics theme should pass any three of the following courses: PHYS3150 Theoretical physics, PHYS3151 Machine learning in physics, PHYS4150 Computational physics, and PHYS4151 Data analysis and modeling in physics out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in computational physics.
- 9. Those who want to specialize in the experimental physics theme should pass PHYS3760 Physics laboratory, plus any two of the following courses: PHYS3660 Astronomy laboratory, PHYS3750 Laser and spectroscopy, PHYS3850 Physical optics, PHYS3851 Atomic and nuclear physics, PHYS4151 Data analysis and modeling in physics, PHYS4551 Solid state physics, and PHYS4850 Particle physics out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in experimental physics.
- 10. Those who want to specialize in the theoretical physics theme should pass any four of the following courses: PHYS3150 Theoretical physics, PHYS3350 Classical mechanics, PHYS3351 Quantum mechanics, PHYS3450 Electromagnetism, PHYS3550 Statistical mechanics & thermodynamics, PHYS4351 Advanced quantum mechanics, PHYS4450 Advanced electromagnetism, PHYS4551 Solid state physics, PHYS4654 General relativity, PHYS4850 Particle physics, PHYS7351 Graduate quantum mechanics, PHYS7450 Graduate electromagnetism, PHYS7550 Graduate statistical mechanics out of which at least two must be 4000+ level courses, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in theoretical physics.
- 11. Upon prior approval, one may use PHYS4966 Physics internship to replace PHYS3999 Directed studies or PHYS4999 Physics project to fulfill the specialization in a theme.
- 12. No double counting is allowed if one wants to specialize in more than one theme. In this case, one is allowed to replace the PHYS3999 Directed studies in physics or PHYS4999 Physics project requirement in one of the theme specializations by a regular course in the same theme of specialization.

Remarks:

Major Title Major in Physics

Offered to students 2017

admitted to Year 1 in

Objectives:

The Major in Physics aims to provide students with a solid foundation on the subject. Core courses form the blocks of fundamental knowledge to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge in physics, research experience and the training of analytical thinking and quantitative reasoning during their studies. Graduates are expected to have acquired the broad training which can equip them well for further studies in multiple science and technology disciplines and to work in their specialized area.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle problems either theoretical or experimental in nature (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: analyze problems qualitatively and quantitatively, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-word setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Mathematics/Physics

Major in Physics (Intensive)

Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

PHYS1250 Fundamental physics (6) PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)

PHYS2260 Heat and waves (6)

PHYS2265 Introductory quantum physics (6) [previous title: Modern physics (6)]

Disciplinary Electives (6 credits)

At least 6 credits selected from the following courses:
PHYS1150 Problem solving in physics (6)

PHYS2055 Introductory relativity (6) [previous title: Introduction to relativity (6) [6] 1

PHYS2150 Methods in physics I (6)

PHYS2155 Methods in physics II (6)

2. Advanced level courses (42 credits) Disciplinary Core Courses (24 credits)

PHYS3350 Classical mechanics (6) PHYS3351 Quantum mechanics (6) PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements.

List A

Theoretical physics (6) PHYS3150 PHYS3151 Machine learning in physics (6) PHYS3551 Introductory solid state physics (6) **PHYS3650** Observational astronomy (6) The physical universe (6) PHYS3651 Principles of astronomy (6) PHYS3652 **PHYS3653** Astrophysics (6) **PHYS3660** Astronomy laboratory (6) Laser and spectroscopy (6) PHYS3750 PHYS3751 Physics of nanomaterials (6) Physics laboratory (6) PHYS3760 PHYS3850 Physical Optics (6)

PHYS3851 Atomic and nuclear physics (6)

PHYS4150 Computational physics (6)

[previous title: Waves and optics (6)]

	PHYS4151	Data analysis and modeling in physics (6)
	PHYS4350	Advanced classical mechanics (6)
	PHYS4351	Advanced quantum mechanics (6)
	PHYS4450	Advanced electromagnetism (6)
	PHYS4550	Advanced statistical mechanics (6)
	PHYS4551	Solid state physics (6)
	PHYS4650	Stellar physics (6)
	PHYS4651	Selected topics in astrophysics (6)
	PHYS4652	Planetary science (6)
	PHYS4653	Cosmology (6)
	PHYS4654	General relativity (6)
	PHYS4655	Interstellar medium (6)
	PHYS4656	Advanced astrophysics (6)
	PHYS4750	Experimental physics (6)
	PHYS4850	Particle physics (6)
	PHYS7350	Graduate classical mechanics (6)
	PHYS7351	Graduate quantum mechanics (6)
	PHYS7450	Graduate electromagnetism (6)
	PHYS7550	Graduate statistical mechanics (6)
	PHYS7551	Graduate solid state physics (6)
	PHYS7650	Stellar atmospheres (6)
	PHYS7750	Nanophysics (6)
3.	Capstone requirement (6 c	redits)
	At least 6 credits selected from	om the following courses:
	PHYS3999	Directed studies in physics (6)
	PHYS4966	Physics internship (6)

Physics project (12)

PHYS4999

Notes:

- 1. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 6. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks

Major Title Major in Physics

Offered to students 2016

admitted to Year 1 in

Objectives:

The Major in Physics aims to provide students with a solid foundation on the subject. Core courses form the blocks of fundamental knowledge to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge in physics, research experience and the training of analytical thinking and quantitative reasoning during their studies. Graduates are expected to have acquired the broad training which can equip them well for further studies in multiple science and technology disciplines and to work in their specialized area.

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By the end of this programme, students should be able to:

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- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-word setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Mathematics/Physics

Major in Physics (Intensive)

Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

PHYS1250 Fundamental physics (6) PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)

PHYS2260 Heat and waves (6)

PHYS2265 Introductory quantum physics (6) [previous title: Modern physics (6)]

Disciplinary Electives (6 credits)

At least 6 credits selected from the following courses:
PHYS1150 Problem solving in physics (6)

PHYS2055 Introductory relativity (6) [previous title: Introduction to relativity (6) [6] 1

PHYS2150 Methods in physics I (6)

PHYS2150 Methods in physics I (6)
PHYS2155 Methods in physics II (6)

2. Advanced level courses (42 credits) Disciplinary Core Courses (24 credits)

PHYS3350 Classical mechanics (6) PHYS3351 Quantum mechanics (6) PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements.

List A

Theoretical physics (6) PHYS3150 PHYS3151 Machine learning in physics (6) PHYS3551 Introductory solid state physics (6) **PHYS3650** Observational astronomy (6) The physical universe (6) PHYS3651 Principles of astronomy (6) PHYS3652 **PHYS3653** Astrophysics (6) **PHYS3660** Astronomy laboratory (6) Laser and spectroscopy (6) PHYS3750 PHYS3751 Physics of nanomaterials (6) Physics laboratory (6) PHYS3760

PHYS3850 Physical Optics (6) [previous title: Waves and optics (6)]

PHYS3851 Atomic and nuclear physics (6) PHYS4150 Computational physics (6)

PHYS4151	Data analysis and modeling in physics (6)
PHYS4350	Advanced classical mechanics (6)
PHYS4351	Advanced quantum mechanics (6)
PHYS4450	Advanced electromagnetism (6)
PHYS4550	Advanced statistical mechanics (6)
PHYS4551	Solid state physics (6)
PHYS4650	Stellar physics (6)
PHYS4651	Selected topics in astrophysics (6)
PHYS4652	Planetary science (6)
PHYS4653	Cosmology (6)
PHYS4654	General relativity (6)
PHYS4655	Interstellar medium (6)
PHYS4656	Advanced astrophysics (6)
PHYS4750	Experimental physics (6)
PHYS4850	Particle physics (6)
PHYS7350	Graduate classical mechanics (6)
PHYS7351	Graduate quantum mechanics (6)
PHYS7450	Graduate electromagnetism (6)
PHYS7550	Graduate statistical mechanics (6)
PHYS7551	Graduate solid state physics (6)
PHYS7650	Stellar atmospheres (6)
PHYS7750	Nanophysics (6)
3. Capstone requirement (6	
At least 6 credits selected f	
PHYS3999	Directed studies in physics (6)
PHYS4966	Physics internship (6)

Physics project (12)

Notes:

PHYS4999

- 1. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details
- 6. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks

Major Title Major in Physics

Offered to students 2015

admitted to Year 1 in

Objectives:

The Major in Physics aims to provide students with a solid foundation on the subject. Core courses form the blocks of fundamental knowledge to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge in physics, research experience and the training of analytical thinking and quantitative reasoning during their studies. Graduates are expected to have acquired the broad training which can equip them well for further studies in multiple science and technology disciplines and to work in their specialized area.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle problems either theoretical or experimental in nature (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: analyze problems qualitatively and quantitatively, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-word setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Mathematics/Physics

Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) Fundamentals of modern science (6) **SCNC1112**

Disciplinary Core Courses (30 credits)

PHYS1250 Fundamental physics (6) Introductory mechanics (6) PHYS2250

PHYS2255 Introductory electricity and magnetism (6)

Heat and waves (6) PHYS2260

Introductory quantum physics (6) **PHYS2265** [previous title: Modern physics (6)]

Disciplinary Electives (6 credits)

At least 6 credits selected from the following courses: PHYS1150 Problem solving in physics (6)

PHYS2055 Introductory relativity (6) [previous title: Introduction to relativity (6)1

Methods in physics I (6)

PHYS2150 Methods in physics II (6) PHYS2155

2. Advanced level courses (42 credits) **Disciplinary Core Courses (24 credits)**

Classical mechanics (6) PHYS3350 PHYS3351 Quantum mechanics (6) PHYS3450 Electromagnetism (6)

Statistical mechanics & thermodynamics (6) PHYS3550

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements.

List A

PHYS3150 Theoretical physics (6) Machine learning in physics (6) PHYS3151 PHYS3551 Introductory solid state physics (6) Observational astronomy (6) PHYS3650 PHYS3651 The physical universe (6) Principles of astronomy (6) **PHYS3652** Astrophysics (6) PHYS3653 Astronomy laboratory (6)

PHYS3660 PHYS3750 Laser and spectroscopy (6) Physics of nanomaterials (6) PHYS3751 PHYS3760 Physics laboratory (6) Physical Optics (6) PHYS3850

PHYS3851 Atomic and nuclear physics (6) PHYS4150 Computational physics (6)

Data analysis and modeling in physics (6) PHYS4151

[previous title: Waves and optics (6)]

PHYS4350	Advanced classical mechanics (6)
PHYS4351	Advanced quantum mechanics (6)
PHYS4450	Advanced electromagnetism (6)
PHYS4550	Advanced statistical mechanics (6)
PHYS4551	Solid state physics (6)
PHYS4650	Stellar physics (6)
PHYS4651	Selected topics in astrophysics (6)
PHYS4652	Planetary science (6)
PHYS4653	Cosmology (6)
PHYS4654	General relativity (6)
PHYS4655	Interstellar medium (6)
PHYS4656	Advanced astrophysics (6)
PHYS4750	Experimental physics (6)
PHYS4850	Particle physics (6)
PHYS7350	Graduate classical mechanics (6)
PHYS7351	Graduate quantum mechanics (6)
PHYS7450	Graduate electromagnetism (6)
PHYS7550	Graduate statistical mechanics (6)
PHYS7551	Graduate solid state physics (6)
PHYS7650	Stellar atmospheres (6)
PHYS7750	Nanophysics (6)
3. Capstone requirement (6 c	redits)
At least 6 credits selected from	om the following courses:
PHYS3999	Directed studies in physics (6)
PHYS4966	Physics internship (6)

Physics project (12)

Notes:

PHYS4999

- 1. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for
- 6. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Major Title Major in Physics

Offered to students 2014

admitted to Year 1 in

Objectives:

The Major in Physics aims to provide students with a solid foundation on the subject. Core courses form the blocks of fundamental knowledge to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge in physics, research experience and the training of analytical thinking and quantitative reasoning during their studies. Graduates are expected to have acquired the broad training which can equip them well for further studies in multiple science and technology disciplines and to work in their specialized area.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle problems either theoretical or experimental in nature (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: analyze problems qualitatively and quantitatively, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-word setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Mathematics/Physics

Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) Fundamentals of modern science (6)

SCNC1112

Disciplinary Core Courses (36 credits)

PHYS1150 Problem solving in physics (6) PHYS1250 Fundamental physics (6) **PHYS2250** Introductory mechanics (6)

Introductory electricity and magnetism (6) **PHYS2255**

Heat and waves (6) PHYS2260

PHYS2265 Introductory quantum physics (6) [previous title: Modern physics (6)]

2. Advanced level courses (42 credits)

Disciplinary Core Courses (24 credits)

Classical mechanics (6) PHYS3350 Quantum mechanics (6) PHYS3351 **PHYS3450** Electromagnetism (6)

Statistical mechanics & thermodynamics (6) PHYS3550

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements.

List	Α
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PHYS3150 Theoretical physics (6) PHYS3551 Introductory solid state physics (6) PHYS3650 Observational astronomy (6) The physical universe (6) PHYS3651 Principles of astronomy (6) PHYS3652 Laser and spectroscopy (6) PHYS3750 PHYS3751 Physics of nanomaterials (6)

PHYS3850 Physical Optics (6) [previous title: Waves and optics (6)]

PHYS3851 Atomic and nuclear physics (6) PHYS4150 Computational physics (6)

Data analysis and modeling in physics (6) PHYS4151 Advanced classical mechanics (6) PHYS4350 PHYS4351 Advanced quantum mechanics (6) **PHYS4450** Advanced electromagnetism (6) PHYS4550 Advanced statistical mechanics (6)

PHYS4551 Solid state physics (6) Stellar physics (6) PHYS4650

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6) **PHYS4653** Cosmology (6)

PHYS4654	General relativity (6)
PHYS4655	Interstellar medium (6)
PHYS4750	Experimental physics (6)
PHYS4850	Particle physics (6)

PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)
PHYS7450 Graduate electromagnetism (6)
PHYS7550 Graduate statistical mechanics (6)
PHYS7551 Graduate solid state physics (6)
PHYS7650 Stellar atmospheres (6)
PHYS7750 Nanophysics (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
PHYS3999 Directed studies in physics (6)
PHYS4966 Physics internship (6)
PHYS4999 Physics project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

Major Title Major in Physics

Offered to students 2013

admitted to Year 1 in

Objectives:

The Major in Physics aims to provide students with a solid foundation on the subject. Core courses form the blocks of fundamental knowledge to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge in physics, research experience and the training of analytical thinking and quantitative reasoning during their studies. Graduates are expected to have acquired the broad training which can equip them well for further studies in multiple science and technology disciplines and to work in their specialized area.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle problems either theoretical or experimental in nature (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: analyze problems qualitatively and quantitatively, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-word setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Mathematics/Physics

Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

PHYS1150 Problem solving in physics (6)
PHYS1250 Fundamental physics (6)
PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)

PHYS2260 Heat and waves (6)

PHYS2265 Introductory quantum physics (6) [previous title: Modern physics (6)]

2. Advanced level courses (42 credits)

Disciplinary Core Courses (24 credits)

PHYS3350 Classical mechanics (6) PHYS3351 Quantum mechanics (6) PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements.

List A

PHYS3150 Theoretical physics (6)
PHYS3551 Introductory solid state physics (6)
PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)
PHYS3750 Laser and spectroscopy (6)
PHYS3751 Physics of nanomaterials (6)

PHYS3850 Physical Optics (6)

[previous title: Waves and optics

(6)]

PHYS3851 Atomic and nuclear physics (6)
PHYS4150 Computational physics (6)

PHYS4151 Data analysis and modeling in physics (6)
PHYS4350 Advanced classical mechanics (6)
PHYS4351 Advanced quantum mechanics (6)
PHYS4450 Advanced electromagnetism (6)
PHYS4550 Advanced statistical mechanics (6)

PHYS4551 Solid state physics (6) PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6) PHYS4653 Cosmology (6)

PHYS4654	General relativity (6)
PHYS4655	Interstellar medium (6)
PHYS4750	Experimental physics (6)
PHYS4850	Particle physics (6)

PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)
PHYS7450 Graduate electromagnetism (6)
PHYS7550 Graduate statistical mechanics (6)
PHYS7551 Graduate solid state physics (6)
PHYS7650 Stellar atmospheres (6)
PHYS7750 Nanophysics (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
PHYS3999 Directed studies in physics (6)
PHYS4966 Physics internship (6)
PHYS4999 Physics project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

Major Title Major in Physics

Offered to students 2012

admitted to Year 1 in

Objectives:

The Major in Physics aims to provide students with a solid foundation on the subject. Core courses form the blocks of fundamental knowledge to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge in physics, research experience and the training of analytical thinking and quantitative reasoning during their studies. Graduates are expected to have acquired the broad training which can equip them well for further studies in multiple science and technology disciplines and to work in their specialized area.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle problems either theoretical or experimental in nature (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: analyze problems qualitatively and quantitatively, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-word setting (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Mathematics/Physics

Minor in Physics

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (36 credits)

PHYS1150 Problem solving in physics (6)
PHYS1250 Fundamental physics (6)
PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)

PHYS2260 Heat and waves (6)

PHYS2265 Introductory quantum physics (6) [previous title: Modern physics (6)]

2. Advanced level courses (42 credits)

Disciplinary Core Courses (24 credits)

PHYS3350 Classical mechanics (6) PHYS3351 Quantum mechanics (6) PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements.

List A

PHYS3150 Theoretical physics (6)
PHYS3551 Introductory solid state physics (6)
PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)
PHYS3750 Laser and spectroscopy (6)
PHYS3751 Physics of nanomaterials (6)

PHYS3850 Physical Optics (6) [previous title: Waves and optics

(6)]

PHYS3851 Atomic and nuclear physics (6)
PHYS4150 Computational physics (6)

PHYS4151 Data analysis and modeling in physics (6)
PHYS4350 Advanced classical mechanics (6)
PHYS4351 Advanced quantum mechanics (6)
PHYS4450 Advanced electromagnetism (6)
PHYS4550 Advanced statistical mechanics (6)

PHYS4551 Solid state physics (6) PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6) PHYS4653 Cosmology (6)

PHYS4654	General relativity (6)
PHYS4655	Interstellar medium (6)
PHYS4750	Experimental physics (6)
PHYS4850	Particle physics (6)

PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)
PHYS7450 Graduate electromagnetism (6)
PHYS7550 Graduate statistical mechanics (6)
PHYS7551 Graduate solid state physics (6)
PHYS7650 Stellar atmospheres (6)
PHYS7750 Nanophysics (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:
PHYS3999 Directed studies in physics (6)
PHYS4966 Physics internship (6)
PHYS4999 Physics project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Capstone requirement for BEd&BSc degree students is different. Students are required to take an additional 6-credit advanced level course (disciplinary electives) in the major to replace the capstone requirement of this Major. Students should consult the Faculty of Education for details.
- 5. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

(Note 1)

Major Title Major in Physics (Intensive)

Offered to students 2020

admitted to Year 1 in

Objectives:

The Major in Physics (Intensive) aims to provide students with a solid foundation on the subject in breadth and depth. It covers a wide range of core areas which provides the intensive preparation to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge and competencies in physics and research experience plus the training of analytical thinking, quantitative reasoning, and problem solving methods during their studies. Graduates are expected to be well-prepared for further studies in physics and related disciplines and to pursue careers in scientific or technical fields.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle problems either theoretical or experimental in nature (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: analyze problems qualitatively and quantitatively based on a broad foundation of theoretical and experimental knowledge in physics, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people of different background, culture, gender and nationality effectively in scientific issues (by means of group project, tutorial session, presentation, exchange, internship and capstone opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-word setting in an advanced level which can position them to pursue postgraduate studies in scientific and technical fields (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Physics Minor in Physics

Required courses	s (144 credits)
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1. Introductory level courses (72 credits)

Disciplinary Core C	rses: Science Foundation Courses (12 credits)	
SCNC1111	Scientific method and reasoning (6)	

SCNC1111 Scientific method and reasoning (6) (Note 1)
SCNC1112 Fundamentals of modern science (6) (Note 1)

Disciplinary Core Courses (48 credits)

PHYS1150 Problem solving in physics (6)
PHYS2055 Introductory relativity (6)
PHYS2150 Methods in physics I (6)
PHYS2155 Methods in physics II (6)
PHYS2250 Introductory mechanics (6)
PHYS2255 Introductory electricity and magnetism (6)

PHYS2255 Introductory electricity and magnetism (6) (Note 1)
PHYS2261 Introductory heat and thermodynamics (6) (Note 1)
PHYS2265 Introductory quantum physics (6) (Note 1)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

COMP1117 Computer programming (6)

MATH1013 University mathematics II (6)

PHYS1650 Nature of the universe (6)

PHYS2160 Introductory computational physics (6)

PHYS2650 Modern astronomy (6) STAT1603 Introductory statistics (6)

2. Advanced level courses (60 credits)

Disciplinary Core Courses (36 credits)

PHYS3150 Theoretical physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3760 Physics laboratory (6)

Disciplinary Electives (24 credits)

All 24 credits should be advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements.

List A

PHYS3151 Machine learning in physics (6)
PHYS3650 Observational astronomy (6)
PHYS3653 Astrophysics (6)
PHYS3660 Astronomy laboratory (6)
PHYS3750 Laser and spectroscopy (6)

PHYS3850	Physical Optics (6)
PHYS3851	Atomic and nuclear physics (6)
PHYS4150	Computational physics (6)
PHYS4151	Data analysis and modeling in physics (6)
PHYS4351	Advanced quantum mechanics (6)
PHYS4450	Advanced electromagnetism (6)
PHYS4550	Advanced statistical mechanics (6)
PHYS4551	Solid state physics (6)
PHYS4650	Stellar physics (6)
PHYS4652	Planetary science (6)
PHYS4653	Cosmology (6)
PHYS4654	General relativity (6)
PHYS4655	Interstellar medium (6)
PHYS4656	Advanced astrophysics (6)
PHYS4850	Particle physics (6)
PHYS7350	Graduate classical mechanics (6)
PHYS7351	Graduate quantum mechanics (6)
PHYS7450	Graduate electromagnetism (6)
PHYS7550	Graduate statistical mechanics (6)
PHYS7750	Nanophysics (6)
3. Capstone requirement (12 credits)	
At least 12 credits selected from the	following courses:
PHYS3999	Directed studies in physics (6)

PHYS3999 Directed studies in physic PHYS4966 Physics internship (6) PHYS4999 Physics project (12)

Notes:

- 1. These are core courses in the regular Physics-Major (96 credits) curriculum.
- 2. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 3. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.
- 4. Those who want to specialize in the astrophysics theme should pass any three of the following courses: PHYS3650 Observational astronomy, PHYS3653 Astrophysics, PHYS3660 Astronomy laboratory, PHYS4652 Planetary science, PHYS4653 Cosmology, PHYS4654 General relativity, PHYS4655 Interstellar medium, and PHYS4656 Advanced astrophysics, out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in astrophysics.
- 5. Those who want to specialize in the computational physics theme should pass any three of the following courses: PHYS3150 Theoretical physics, PHYS3151 Machine learning in physics, PHYS4150 Computational physics, and PHYS4151 Data analysis and modeling in physics out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in computational physics.
- 6. Those who want to specialize in the experimental physics theme should pass PHYS3760 Physics laboratory, plus any two of the following courses: PHYS3660 Astronomy laboratory, PHYS3750 Laser and spectroscopy, PHYS3850 Physical optics, PHYS3851 Atomic and nuclear physics, PHYS4151 Data analysis and modeling in physics, PHYS4551 Solid state physics, and PHYS4850 Particle physics out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in experimental physics.
- 7. Those who want to specialize in the theoretical physics theme should pass any four of the following courses: PHYS3150 Theoretical physics, PHYS3350 Classical mechanics, PHYS3351 Quantum mechanics, PHYS3450 Electromagnetism, PHYS3550 Statistical mechanics & thermodynamics, PHYS4351 Advanced quantum mechanics, PHYS4450 Advanced electromagnetism, PHYS4551 Solid state physics, PHYS4654 General relativity, PHYS4850 Particle physics, PHYS7351 Graduate quantum mechanics, PHYS7450 Graduate electromagnetism, PHYS7550 Graduate statistical mechanics out of which at least two must be 4000+ level courses, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in theoretical physics.
- 8. Upon prior approval, one may use PHYS4966 Physics internship to replace PHYS3999 Directed studies or PHYS4999 Physics project to fulfill the specialization in a theme.
- 9. No double counting is allowed if one wants to specialize in more than one theme. In this case, one is allowed to replace the PHYS3999 Directed studies in physics or PHYS4999 Physics project requirement in one of the theme specializations by a regular course in the same theme of specialization.
- 10. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Major Title Major in Physics (Intensive)

Offered to students 2019

admitted to Year 1 in

Objectives:

The Major in Physics (Intensive) aims to provide students with a solid foundation on the subject in breadth and depth. It covers a wide range of core areas which provides the intensive preparation to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge and competencies in physics and research experience plus the training of analytical thinking, quantitative reasoning, and problem solving methods during their studies. Graduates are expected to be well-prepared for further studies in physics and related disciplines and to pursue careers in scientific or technical fields.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle problems either theoretical or experimental in nature (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: analyze problems qualitatively and quantitatively based on a broad foundation of theoretical and experimental knowledge in physics, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people of different background, culture, gender and nationality effectively in scientific issues (by means of group project, tutorial session, presentation, exchange, internship and capstone opportunities in the curriculum)
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Impermissible Combinations:

Major in Physics Minor in Physics

Required	courses	(144	credits)

1. Introductory level courses (72 credits)

SCNC1111 Scientific method and reasoning (6) (Note 1) SCNC1112 Fundamentals of modern science (6) (Note 1)

Disciplinary Core Courses (48 credits)

Problem solving in physics (6) PHYS1150 Introductory relativity (6) PHYS2055 Methods in physics I (6) PHYS2150 **PHYS2155** Methods in physics II (6) Introductory mechanics (6) (Note 1) PHYS2250 Introductory electricity and magnetism (6) (Note 1) **PHYS2255** Introductory heat and thermodynamics (6) (Note 1) PHYS2261 **PHYS2265** Introductory quantum physics (6) (Note 1)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

COMP1117 Computer programming (6)

MATH1013 University mathematics II (6)

PHYS1650 Nature of the universe (6)

PHYS2160 Introductory computational physics (6)

PHYS2650 Modern astronomy (6) STAT1603 Introductory statistics (6)

2. Advanced level courses (60 credits)

Disciplinary Core Courses (36 credits)

PHYS3150 Theoretical physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3760 Physics laboratory (6)

Disciplinary Electives (24 credits)

All 24 credits should be advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements.

List A

PHYS3151 Machine learning in physics (6)
PHYS3650 Observational astronomy (6)
PHYS3653 Astrophysics (6)
PHYS3660 Astronomy laboratory (6)
PHYS3750 Laser and spectroscopy (6)

	PHYS3850	Physical Optics (6)	[previous title: Waves and optics (6)]
	PHYS3851	Atomic and nuclear physics (6)	(6)1
	PHYS4150	Computational physics (6)	
	PHYS4151	Data analysis and modeling in physics (6)	
	PHYS4351	Advanced quantum mechanics (6)	
	PHYS4450	Advanced electromagnetism (6)	
	PHYS4550	Advanced statistical mechanics (6)	
	PHYS4551	Solid state physics (6)	
	PHYS4650	Stellar physics (6)	
	PHYS4652	Planetary science (6)	
	PHYS4653	Cosmology (6)	
	PHYS4654	General relativity (6)	
	PHYS4655	Interstellar medium (6)	
	PHYS4656	Advanced astrophysics (6)	
	PHYS4850	Particle physics (6)	
	PHYS7350	Graduate classical mechanics (6)	
	PHYS7351	Graduate quantum mechanics (6)	
	PHYS7450	Graduate electromagnetism (6)	
	PHYS7550	Graduate statistical mechanics (6)	
	PHYS7750	Nanophysics (6)	
	3. Capstone requirement	nt (12 credits)	
	At least 12 credits sel	ected from the following courses:	
	PHYS3999	Directed studies in physics (6)	
	PHYS4966	Physics internship (6)	
	PHYS4999	Physics project (12)	
П			

- 1. These are core courses in the regular Physics-Major (96 credits) curriculum.
- 2. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 3. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.
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- 5. Those who want to specialize in the computational physics theme should pass any three of the following courses: PHYS3150 Theoretical physics, PHYS3151 Machine learning in physics, PHYS4150 Computational physics, and PHYS4151 Data analysis and modeling in physics out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in computational physics.
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- 8. Upon prior approval, one may use PHYS4966 Physics internship to replace PHYS3999 Directed studies or PHYS4999 Physics project to fulfill the specialization in a theme.
- 9. No double counting is allowed if one wants to specialize in more than one theme. In this case, one is allowed to replace the PHYS3999 Directed studies in physics or PHYS4999 Physics project requirement in one of the theme specializations by a regular course in the same theme of specialization.

Remarks

Major Title Major in Physics (Intensive)

Offered to students 2018

admitted to Year 1 in

Objectives:

The Major in Physics (Intensive) aims to provide students with a solid foundation on the subject in breadth and depth. It covers a wide range of core areas which provides the intensive preparation to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge and competencies in physics and research experience plus the training of analytical thinking, quantitative reasoning, and problem solving methods during their studies. Graduates are expected to be well-prepared for further studies in physics and related disciplines and to pursue careers in scientific or technical fields.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
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Impermissible Combinations:

Major in Physics Minor in Physics

Required courses (144 credits)

1. Introductory level courses (72 credits)

Disciplinary Core	Courses: Science	Foundation (Courses (12 cr	edits)
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SCNC1111 Scientific method and reasoning (6) (Note 1) SCNC1112 Fundamentals of modern science (6) (Note 1)

Disciplinary Core Courses (48 credits)

Problem solving in physics (6) PHYS1150 Introductory relativity (6) PHYS2055 Methods in physics I (6) PHYS2150 **PHYS2155** Methods in physics II (6) Introductory mechanics (6) (Note 1) PHYS2250 Introductory electricity and magnetism (6) (Note 1) **PHYS2255** Introductory heat and thermodynamics (6) (Note 1) PHYS2261 **PHYS2265** Introductory quantum physics (6) (Note 1)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: COMP1117 Computer programming (6) University mathematics II (6) MATH1013 PHYS1650 Nature of the universe (6)

Introductory computational physics (6) PHYS2160

PHYS2650 Modern astronomy (6) Introductory statistics (6) STAT1603

2. Advanced level courses (60 credits)

Disciplinary Core Courses (36 credits)

Theoretical physics (6) PHYS3150 Classical mechanics (6) PHYS3350 PHYS3351 Quantum mechanics (6) **PHYS3450** Electromagnetism (6)

Statistical mechanics & thermodynamics (6) PHYS3550

Physics laboratory (6) PHYS3760

Disciplinary Electives (24 credits)

All 24 credits should be advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements.

List A

PHYS3151 Machine learning in physics (6) **PHYS3650** Observational astronomy (6) PHYS3653 Astrophysics (6) Astronomy laboratory (6) PHYS3660

PHYS3750 Laser and spectroscopy (6)

	PHYS3850	Physical Optics (6)	[previous title: Waves and optics (6)]
	PHYS3851	Atomic and nuclear physics (6)	(6)1
	PHYS4150	Computational physics (6)	
	PHYS4151	Data analysis and modeling in physics (6)	
	PHYS4351	Advanced quantum mechanics (6)	
	PHYS4450	Advanced electromagnetism (6)	
	PHYS4550	Advanced statistical mechanics (6)	
	PHYS4551	Solid state physics (6)	
	PHYS4650	Stellar physics (6)	
	PHYS4652	Planetary science (6)	
	PHYS4653	Cosmology (6)	
	PHYS4654	General relativity (6)	
	PHYS4655	Interstellar medium (6)	
	PHYS4656	Advanced astrophysics (6)	
	PHYS4850	Particle physics (6)	
	PHYS7350	Graduate classical mechanics (6)	
	PHYS7351	Graduate quantum mechanics (6)	
	PHYS7450	Graduate electromagnetism (6)	
	PHYS7550	Graduate statistical mechanics (6)	
	PHYS7750	Nanophysics (6)	
	3. Capstone requirement	nt (12 credits)	
	At least 12 credits sel	ected from the following courses:	
	PHYS3999	Directed studies in physics (6)	
	PHYS4966	Physics internship (6)	
	PHYS4999	Physics project (12)	
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- 1. These are core courses in the regular Physics-Major (96 credits) curriculum.
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- 4. Those who want to specialize in the astrophysics theme should pass any three of the following courses: PHYS3650 Observational astronomy, PHYS3653 Astrophysics, PHYS3660 Astronomy laboratory, PHYS4652 Planetary science, PHYS4653 Cosmology, PHYS4654 General relativity, PHYS4655 Interstellar medium, and PHYS4656 Advanced astrophysics, out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in astrophysics.
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- 7. Those who want to specialize in the theoretical physics theme should pass any four of the following courses: PHYS3150 Theoretical physics, PHYS3350 Classical mechanics, PHYS3351 Quantum mechanics, PHYS3450 Electromagnetism, PHYS4550 Statistical mechanics & thermodynamics, PHYS4351 Advanced quantum mechanics, PHYS4450 Advanced electromagnetism, PHYS4551 Solid state physics, PHYS4654 General relativity, PHYS4850 Particle physics, PHYS7351 Graduate quantum mechanics, PHYS7450 Graduate electromagnetism, PHYS7550 Graduate statistical mechanics out of which at least two must be 4000+ level courses, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in theoretical physics.
- 8. Upon prior approval, one may use PHYS4966 Physics internship to replace PHYS3999 Directed studies or PHYS4999 Physics project to fulfill the specialization in a theme.
- 9. No double counting is allowed if one wants to specialize in more than one theme. In this case, one is allowed to replace the PHYS3999 Directed studies in physics or PHYS4999 Physics project requirement in one of the theme specializations by a regular course in the same theme of specialization.

Remarks

Major Title Major in Physics (Intensive)

Offered to students 2017

admitted to Year 1 in

Objectives:

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By the end of this programme, students should be able to:

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(Note 1)

Impermissible Combinations:

Major in Physics Minor in Physics

Required courses	(144 credits)
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1. Introductory level courses (72 credits)

Disciplinary Core	Courses: Science	Foundation Co	urses (12 credits)
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SCNC1111 Scientific method and reasoning (6) (Note 1) SCNC1112 Fundamentals of modern science (6) (Note 1)

Disciplinary Core Courses (48 credits)

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PHYS2055 Introductory relativity (6)
PHYS2150 Methods in physics I (6)
PHYS2155 Methods in physics II (6)
PHYS2250 Introductory mechanics (6)
PHYS2255 Introductory electricity and magnetism (6)

PHYS2255 Introductory electricity and magnetism (6) (Note 1)
PHYS2261 Introductory heat and thermodynamics (6)
PHYS2265 Introductory quantum physics (6) (Note 1)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

COMP1117 Computer programming (6)

MATH1013 University mathematics II (6)

PHYS1650 Nature of the universe (6)
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PHYS2650 Modern astronomy (6) STAT1603 Introductory statistics (6)

2. Advanced level courses (60 credits)

Disciplinary Core Courses (36 credits)

 PHYS3150
 Theoretical physics (6)

 PHYS3350
 Classical mechanics (6)
 (Note 1)

 PHYS3351
 Quantum mechanics (6)
 (Note 1)

 PHYS3450
 Electromagnetism (6)
 (Note 1)

 PHYS3550
 Statistical mechanics & thermodynamics (6)
 (Note 1)

PHYS3760 Physics laboratory (6)

Disciplinary Electives (24 credits)

All 24 credits should be advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements.

List A

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PHYS3750 Laser and spectroscopy (6)

PHYS3850	Physical Optics (6)	[previous title: Waves and optics (6)]
PHYS3851	Atomic and nuclear physics (6)	(-/)
PHYS4150	Computational physics (6)	
PHYS4151	Data analysis and modeling in physics (6)	
PHYS4351	Advanced quantum mechanics (6)	
PHYS4450	Advanced electromagnetism (6)	
PHYS4550	Advanced statistical mechanics (6)	
PHYS4551	Solid state physics (6)	
PHYS4650	Stellar physics (6)	
PHYS4652	Planetary science (6)	
PHYS4653	Cosmology (6)	
PHYS4654	General relativity (6)	
PHYS4655	Interstellar medium (6)	
PHYS4656	Advanced astrophysics (6)	
PHYS4850	Particle physics (6)	
PHYS7350	Graduate classical mechanics (6)	
PHYS7351	Graduate quantum mechanics (6)	
PHYS7450	Graduate electromagnetism (6)	
PHYS7550	Graduate statistical mechanics (6)	
PHYS7750	Nanophysics (6)	
3. Capstone requirement	ent (12 credits)	
At least 12 credits se	elected from the following courses:	
PHYS3999	Directed studies in physics (6)	
PHYS4966	Physics internship (6)	
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- 1. These are core courses in the regular Physics-Major (96 credits) curriculum.
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- 4. Those who want to specialize in the astrophysics theme should pass any three of the following courses: PHYS3650 Observational astronomy, PHYS3653 Astrophysics, PHYS3660 Astronomy laboratory, PHYS4652 Planetary science, PHYS4653 Cosmology, PHYS4654 General relativity, PHYS4655 Interstellar medium, and PHYS4656 Advanced astrophysics, out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in astrophysics.
- 5. Those who want to specialize in the computational physics theme should pass any three of the following courses: PHYS3150 Theoretical physics, PHYS3151 Machine learning in physics, PHYS4150 Computational physics, and PHYS4151 Data analysis and modeling in physics out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in computational physics.
- 6. Those who want to specialize in the experimental physics theme should pass PHYS3760 Physics laboratory, plus any two of the following courses: PHYS3660 Astronomy laboratory, PHYS3750 Laser and spectroscopy, PHYS3850 Physical optics, PHYS3851 Atomic and nuclear physics, PHYS4151 Data analysis and modeling in physics, PHYS4551 Solid state physics, and PHYS4850 Particle physics out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in experimental physics.
- 7. Those who want to specialize in the theoretical physics theme should pass any four of the following courses: PHYS3150 Theoretical physics, PHYS3350 Classical mechanics, PHYS3351 Quantum mechanics, PHYS3450 Electromagnetism, PHYS4550 Statistical mechanics & thermodynamics, PHYS4351 Advanced quantum mechanics, PHYS4450 Advanced electromagnetism, PHYS4551 Solid state physics, PHYS4654 General relativity, PHYS4850 Particle physics, PHYS7351 Graduate quantum mechanics, PHYS7450 Graduate electromagnetism, PHYS7550 Graduate statistical mechanics out of which at least two must be 4000+ level courses, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in theoretical physics.
- 8. Upon prior approval, one may use PHYS4966 Physics internship to replace PHYS3999 Directed studies or PHYS4999 Physics project to fulfill the specialization in a theme.
- 9. No double counting is allowed if one wants to specialize in more than one theme. In this case, one is allowed to replace the PHYS3999 Directed studies in physics or PHYS4999 Physics project requirement in one of the theme specializations by a regular course in the same theme of specialization.

Remarks

Major Title Major in Physics (Intensive)

Offered to students 2016

admitted to Year 1 in

Objectives:

The Major in Physics (Intensive) aims to provide students with a solid foundation on the subject in breadth and depth. It covers a wide range of core areas which provides the intensive preparation to pursue learning in specializations, e.g. quantum mechanics, statistical mechanics, classical mechanics and electrodynamics. A large selection of elective courses is provided for students to pursue a wide range of topics from the very small scale (i.e. subatomic particles) to the large scale (i.e. cosmology). Students will attain professional knowledge and competencies in physics and research experience plus the training of analytical thinking, quantitative reasoning, and problem solving methods during their studies. Graduates are expected to be well-prepared for further studies in physics and related disciplines and to pursue careers in scientific or technical fields.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with their professional knowledge (by means of coursework and tutorial classes in the curriculum)
- PLO 2: have developed their scientific intuition, abilities and techniques to tackle problems either theoretical or experimental in nature (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: analyze problems qualitatively and quantitatively based on a broad foundation of theoretical and experimental knowledge in physics, and appraise the related ethical issues (by means of coursework, tutorial classes and research-based projects in the curriculum)
- PLO 4: communicate and collaborate with people of different background, culture, gender and nationality effectively in scientific issues (by means of group project, tutorial session, presentation, exchange, internship and capstone opportunities in the curriculum)
- PLO 5: apply scientific and quantitative methods in tackling problems in research or real-word setting in an advanced level which can position them to pursue postgraduate studies in scientific and technical fields (by means of projects, directed studies, local and foreign internships attached to universities, research centers, government bodies, NGOs and influential companies)

Impermissible Combinations:

Major in Physics Minor in Physics

Required	courses	(144	credits)

1. Introductory level courses (72 credits)

Disciplinary Core	Courses: Science	Foundation (Courses (12 cr	edits)
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SCNC1111 Scientific method and reasoning (6) (Note 1) SCNC1112 Fundamentals of modern science (6) (Note 1)

Disciplinary Core Courses (48 credits)

Problem solving in physics (6) PHYS1150 Introductory relativity (6) PHYS2055 Methods in physics I (6) PHYS2150 **PHYS2155** Methods in physics II (6) Introductory mechanics (6) (Note 1) PHYS2250 Introductory electricity and magnetism (6) (Note 1) **PHYS2255** Introductory heat and thermodynamics (6) PHYS2261 **PHYS2265** Introductory quantum physics (6) (Note 1)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:
COMP1117 Computer programming (6)

MATH1013 University mathematics II (6) PHYS1650 Nature of the universe (6)

PHYS2160 Introductory computational physics (6)

PHYS2650 Modern astronomy (6) STAT1603 Introductory statistics (6)

2. Advanced level courses (60 credits)

Disciplinary Core Courses (36 credits)

 PHYS3150
 Theoretical physics (6)

 PHYS3350
 Classical mechanics (6)
 (Note 1)

 PHYS3351
 Quantum mechanics (6)
 (Note 1)

 PHYS3450
 Electromagnetism (6)
 (Note 1)

 PHYS3550
 Statistical mechanics & thermodynamics (6)
 (Note 1)

PHYS3760 Physics laboratory (6)

Disciplinary Electives (24 credits)

All 24 credits should be advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current list includes courses in List A and those courses not selected to fulfill the capstone requirements.

List A

PHYS3151 Machine learning in physics (6)
PHYS3650 Observational astronomy (6)
PHYS3653 Astrophysics (6)
PHYS3660 Astronomy laboratory (6)
PHYS3750 Laser and spectroscopy (6)

	PHYS3850	Physical Optics (6)	[previous title: Waves and optics (6)]
	PHYS3851	Atomic and nuclear physics (6)	(6)1
	PHYS4150	Computational physics (6)	
	PHYS4151	Data analysis and modeling in physics (6)	
	PHYS4351	Advanced quantum mechanics (6)	
	PHYS4450	Advanced electromagnetism (6)	
	PHYS4550	Advanced statistical mechanics (6)	
	PHYS4551	Solid state physics (6)	
	PHYS4650	Stellar physics (6)	
	PHYS4652	Planetary science (6)	
	PHYS4653	Cosmology (6)	
	PHYS4654	General relativity (6)	
	PHYS4655	Interstellar medium (6)	
	PHYS4656	Advanced astrophysics (6)	
	PHYS4850	Particle physics (6)	
	PHYS7350	Graduate classical mechanics (6)	
	PHYS7351	Graduate quantum mechanics (6)	
	PHYS7450	Graduate electromagnetism (6)	
	PHYS7550	Graduate statistical mechanics (6)	
	PHYS7750	Nanophysics (6)	
	3. Capstone requirement	nt (12 credits)	
	At least 12 credits sel	ected from the following courses:	
	PHYS3999	Directed studies in physics (6)	
	PHYS4966	Physics internship (6)	
	PHYS4999	Physics project (12)	
П			

- 1. These are core courses in the regular Physics-Major (96 credits) curriculum.
- 2. Students are strongly advised to consult departmental course selection advisors for course and career planning before selecting the courses.
- 3. Students must have level 3 or above in HKDSE Physics or equivalent to take this major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.
- 4. Those who want to specialize in the astrophysics theme should pass any three of the following courses: PHYS3650 Observational astronomy, PHYS3653 Astrophysics, PHYS3660 Astronomy laboratory, PHYS4652 Planetary science, PHYS4653 Cosmology, PHYS4654 General relativity, PHYS4655 Interstellar medium, and PHYS4656 Advanced astrophysics, out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in astrophysics.
- 5. Those who want to specialize in the computational physics theme should pass any three of the following courses: PHYS3150 Theoretical physics, PHYS3151 Machine learning in physics, PHYS4150 Computational physics, and PHYS4151 Data analysis and modeling in physics out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in computational physics.
- 6. Those who want to specialize in the experimental physics theme should pass PHYS3760 Physics laboratory, plus any two of the following courses: PHYS3660 Astronomy laboratory, PHYS3750 Laser and spectroscopy, PHYS3850 Physical optics, PHYS3851 Atomic and nuclear physics, PHYS4151 Data analysis and modeling in physics, PHYS4551 Solid state physics, and PHYS4850 Particle physics out of which at least one must be a 4000+ level course, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in experimental physics.
- 7. Those who want to specialize in the theoretical physics theme should pass any four of the following courses: PHYS3150 Theoretical physics, PHYS3350 Classical mechanics, PHYS3351 Quantum mechanics, PHYS3450 Electromagnetism, PHYS4550 Statistical mechanics & thermodynamics, PHYS4351 Advanced quantum mechanics, PHYS4450 Advanced electromagnetism, PHYS4551 Solid state physics, PHYS4654 General relativity, PHYS4850 Particle physics, PHYS7351 Graduate quantum mechanics, PHYS7450 Graduate electromagnetism, PHYS7550 Graduate statistical mechanics out of which at least two must be 4000+ level courses, as well as passing either PHYS3999 Directed studies in physics or PHYS4999 Physics project with topics of study in theoretical physics.
- 8. Upon prior approval, one may use PHYS4966 Physics internship to replace PHYS3999 Directed studies or PHYS4999 Physics project to fulfill the specialization in a theme.
- 9. No double counting is allowed if one wants to specialize in more than one theme. In this case, one is allowed to replace the PHYS3999 Directed studies in physics or PHYS4999 Physics project requirement in one of the theme specializations by a regular course in the same theme of specialization.

Remarks

Major Title Major in Risk Management

Offered to students 2020

admitted to Year 1 in

Objectives:

The Major in Risk Management aims to provide students with the skills and expertise in the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other related areas of interest. It is designed to provide solid training in the concepts of the risk management process, statistical models and methods of risk management, and good risk management practice. Core courses in the curriculum emphasize fundamental concepts and nature of risk assessment, risk management and governance from different standpoints while elective courses provide either training in specific Risk Management disciplines or an extension of knowledge aiming to give students more modeling, technical and analytical skills in risk management, including data mining, stochastic calculus, and financial time series modeling.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: analyze and assess risk management situations, and be able to deal with qualitative as well as quantitative aspects appropriate to the situation (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: critically evaluate and make effective use of models and techniques for risk assessment and management, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: make informed risk management decisions, employ any techniques necessary to acquire and interpret relevant data and information from different sources and the factors that influence their perceptions of risk identification, risk reduction, risk mitigation and risk transfer (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on risk management issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: gain insights into current advances in risk management through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Statistics

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6) STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3609 The statistics of investment risk (6)
STAT3615 Practical mathematics for investment (6)

STAT4601 Time-series analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

STAT3603 Stochastic processes (6)
STAT3610 Risk management and insurance (6)

STAT3610 Risk management and insurance (6)
STAT3612 Statistical machine learning (6)
STAT3618 Derivatives and risk management (6)
STAT3911 Financial economics II (6)
STAT4603 Current topics in risk management (6)

STAT4603 Current topics in risk management (6)
STAT4606 Risk management and Basel Accords in banking and finance

(6)

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12) [previous title: Probability modelling (6)]

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.
- 6. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Major Title Major in Risk Management

Offered to students 2019

admitted to Year 1 in

Objectives:

The Major in Risk Management aims to provide students with the skills and expertise in the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other related areas of interest. It is designed to provide solid training in the concepts of the risk management process, statistical models and methods of risk management, and good risk management practice. Core courses in the curriculum emphasize fundamental concepts and nature of risk assessment, risk management and governance from different standpoints while elective courses provide either training in specific Risk Management disciplines or an extension of knowledge aiming to give students more modeling, technical and analytical skills in risk management, including data mining, stochastic calculus, and financial time series modeling.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: analyze and assess risk management situations, and be able to deal with qualitative as well as quantitative aspects appropriate to the situation (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: critically evaluate and make effective use of models and techniques for risk assessment and management, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: make informed risk management decisions, employ any techniques necessary to acquire and interpret relevant data and information from different sources and the factors that influence their perceptions of risk identification, risk reduction, risk mitigation and risk transfer (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on risk management issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: gain insights into current advances in risk management through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Statistics

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6) STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3609 The statistics of investment risk (6)
STAT3615 Practical mathematics for investment (6)

STAT4601 Time-series analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses: STAT3603 Stochastic processes (6)

STAT3610 Risk management and insurance (6) STAT3612 Statistical machine learning (6)

STAT3612 Statistical machine learning (6)
STAT3618 Derivatives and risk management (6)
STAT3911 Financial economics II (6)

STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6)

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12) [previous title: Probability modelling (6)]

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Risk Management

Offered to students 2018

admitted to Year 1 in

Objectives:

The Major in Risk Management aims to provide students with the skills and expertise in the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other related areas of interest. It is designed to provide solid training in the concepts of the risk management process, statistical models and methods of risk management, and good risk management practice. Core courses in the curriculum emphasize fundamental concepts and nature of risk assessment, risk management and governance from different standpoints while elective courses provide either training in specific Risk Management disciplines or an extension of knowledge aiming to give students more modeling, technical and analytical skills in risk management, including data mining, stochastic calculus, and financial time series modeling.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: analyze and assess risk management situations, and be able to deal with qualitative as well as quantitative aspects appropriate to the situation (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: critically evaluate and make effective use of models and techniques for risk assessment and management, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: make informed risk management decisions, employ any techniques necessary to acquire and interpret relevant data and information from different sources and the factors that influence their perceptions of risk identification, risk reduction, risk mitigation and risk transfer (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on risk management issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: gain insights into current advances in risk management through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Statistics

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6) STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3609 The statistics of investment risk (6)
STAT3615 Practical mathematics for investment (6)

STAT4601 Time-series analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]
STAT3610 Risk management and insurance (6)

[previous title: Data mining (6)]

STAT3610 Risk management and insurance (6)
STAT3612 Statistical machine learning (6)
STAT3618 Derivatives and risk management (6)
STAT3911 Financial economics II (6)

STAT3911 Financial economics II (6) STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6)

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Risk Management

Offered to students 2017

admitted to Year 1 in

Objectives:

The Major in Risk Management aims to provide students with the skills and expertise in the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other related areas of interest. It is designed to provide solid training in the concepts of the risk management process, statistical models and methods of risk management, and good risk management practice. Core courses in the curriculum emphasize fundamental concepts and nature of risk assessment, risk management and governance from different standpoints while elective courses provide either training in specific Risk Management disciplines or an extension of knowledge aiming to give students more modeling, technical and analytical skills in risk management, including data mining, stochastic calculus, and financial time series modeling.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: analyze and assess risk management situations, and be able to deal with qualitative as well as quantitative aspects appropriate to the situation (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: critically evaluate and make effective use of models and techniques for risk assessment and management, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: make informed risk management decisions, employ any techniques necessary to acquire and interpret relevant data and information from different sources and the factors that influence their perceptions of risk identification, risk reduction, risk mitigation and risk transfer (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on risk management issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: gain insights into current advances in risk management through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Statistics

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6) STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3609 The statistics of investment risk (6)
STAT3615 Practical mathematics for investment (6)

STAT4601 Time-series analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]

[previous title: Data mining (6)]

STAT3610 Risk management and insurance (6)
STAT3612 Statistical machine learning (6)
STAT3618 Derivatives and risk management (6)

STAT3911 Financial economics II (6) STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6)

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Risk Management

Offered to students 2016

admitted to Year 1 in

Objectives:

The Major in Risk Management aims to provide students with the skills and expertise in the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other related areas of interest. It is designed to provide solid training in the concepts of the risk management process, statistical models and methods of risk management, and good risk management practice. Core courses in the curriculum emphasize fundamental concepts and nature of risk assessment, risk management and governance from different standpoints while elective courses provide either training in specific Risk Management disciplines or an extension of knowledge aiming to give students more modeling, technical and analytical skills in risk management, including data mining, stochastic calculus, and financial time series modeling.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: analyze and assess risk management situations, and be able to deal with qualitative as well as quantitative aspects appropriate to the situation (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: critically evaluate and make effective use of models and techniques for risk assessment and management, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: make informed risk management decisions, employ any techniques necessary to acquire and interpret relevant data and information from different sources and the factors that influence their perceptions of risk identification, risk reduction, risk mitigation and risk transfer (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on risk management issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: gain insights into current advances in risk management through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Statistics

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6) STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3609 The statistics of investment risk (6)
STAT3615 Practical mathematics for investment (6)

STAT4601 Time-series analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]
STAT3610 Risk management and insurance (6)

[previous title: Data mining (6)]

STAT3612 Statistical machine learning (6)
STAT3618 Derivatives and risk management (6)

STAT3911 Financial economics II (6) STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Risk Management

Offered to students 2015

admitted to Year 1 in

Objectives:

The Major in Risk Management aims to provide students with the skills and expertise in the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other related areas of interest. It is designed to provide solid training in the concepts of the risk management process, statistical models and methods of risk management, and good risk management practice. Core courses in the curriculum emphasize fundamental concepts and nature of risk assessment, risk management and governance from different standpoints while elective courses provide either training in specific Risk Management disciplines or an extension of knowledge aiming to give students more modeling, technical and analytical skills in risk management, including data mining, stochastic calculus, and financial time series modeling.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: analyze and assess risk management situations, and be able to deal with qualitative as well as quantitative aspects appropriate to the situation (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: critically evaluate and make effective use of models and techniques for risk assessment and management, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: make informed risk management decisions, employ any techniques necessary to acquire and interpret relevant data and information from different sources and the factors that influence their perceptions of risk identification, risk reduction, risk mitigation and risk transfer (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on risk management issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: gain insights into current advances in risk management through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Statistics

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6) STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3609 The statistics of investment risk (6)
STAT3615 Practical mathematics for investment (6)

STAT4601 Time-series analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]
STAT3610 Risk management and insurance (6)

[previous title: Data mining (6)]

STAT3612 Statistical machine learning (6)
STAT3618 Derivatives and risk management (6)

STAT3911 Financial economics II (6) STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Risk Management

Offered to students 2014

admitted to Year 1 in

Objectives:

The Major in Risk Management aims to provide students with the skills and expertise in the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other related areas of interest. It is designed to provide solid training in the concepts of the risk management process, statistical models and methods of risk management, and good risk management practice. Core courses in the curriculum emphasize fundamental concepts and nature of risk assessment, risk management and governance from different standpoints while elective courses provide either training in specific Risk Management disciplines or an extension of knowledge aiming to give students more modeling, technical and analytical skills in risk management, including data mining, stochastic calculus, and financial time series modeling.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: analyze and assess risk management situations, and be able to deal with qualitative as well as quantitative aspects appropriate to the situation (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: critically evaluate and make effective use of models and techniques for risk assessment and management, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: make informed risk management decisions, employ any techniques necessary to acquire and interpret relevant data and information from different sources and the factors that influence their perceptions of risk identification, risk reduction, risk mitigation and risk transfer (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on risk management issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: gain insights into current advances in risk management through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Statistics

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6) STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3609 The statistics of investment risk (6)
STAT3615 Practical mathematics for investment (6)

STAT4601 Time-series analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]
STAT3610 Risk management and insurance (6)

[previous title: Data mining (6)]

STAT3612 Statistical machine learning (6)
STAT3618 Derivatives and risk management (6)

STAT3911 Financial economics II (6) STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6)

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Risk Management

Offered to students 2013

admitted to Year 1 in

Objectives:

The Major in Risk Management aims to provide students with the skills and expertise in the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other related areas of interest. It is designed to provide solid training in the concepts of the risk management process, statistical models and methods of risk management, and good risk management practice. Core courses in the curriculum emphasize fundamental concepts and nature of risk assessment, risk management and governance from different standpoints while elective courses provide either training in specific Risk Management disciplines or an extension of knowledge aiming to give students more modeling, technical and analytical skills in risk management, including data mining, stochastic calculus, and financial time series modeling.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: analyze and assess risk management situations, and be able to deal with qualitative as well as quantitative aspects appropriate to the situation (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: critically evaluate and make effective use of models and techniques for risk assessment and management, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: make informed risk management decisions, employ any techniques necessary to acquire and interpret relevant data and information from different sources and the factors that influence their perceptions of risk identification, risk reduction, risk mitigation and risk transfer (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on risk management issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: gain insights into current advances in risk management through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Decision Analytics

Major in Statistics

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6)
STAT1600 Statistics: ideas and concepts (6)
STAT2601 Probability and statistics II (6)
STAT2602 Probability and statistics II (6)
STAT2603 Data management with SAS (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3609 The statistics of investment risk (6)
STAT3615 Practical mathematics for investment (6)

STAT4601 Time-series analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]
STAT3610 Risk management and insurance (6)

STAT3610 Risk management and insurance (6)
STAT3612 Statistical machine learning (6) [previous title: Data mining (6)]
STAT3618 Derivatives and risk management (6)

STAT3911 Financial economics II (6)

STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Risk Management

Offered to students 2012

admitted to Year 1 in

Objectives:

The Major in Risk Management aims to provide students with the skills and expertise in the theory and methodology behind the scientific process of risk management, with application to actuarial science, finance and other related areas of interest. It is designed to provide solid training in the concepts of the risk management process, statistical models and methods of risk management, and good risk management practice. Core courses in the curriculum emphasize fundamental concepts and nature of risk assessment, risk management and governance from different standpoints while elective courses provide either training in specific Risk Management disciplines or an extension of knowledge aiming to give students more modeling, technical and analytical skills in risk management, including data mining, stochastic calculus, and financial time series modeling.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and categorize the various risks faced by an organization and be able to demonstrate a critical understanding of generic risk management issues and techniques (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: analyze and assess risk management situations, and be able to deal with qualitative as well as quantitative aspects appropriate to the situation (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: critically evaluate and make effective use of models and techniques for risk assessment and management, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 4: make informed risk management decisions, employ any techniques necessary to acquire and interpret relevant data and information from different sources and the factors that influence their perceptions of risk identification, risk reduction, risk mitigation and risk transfer (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on risk management issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: gain insights into current advances in risk management through either project or industrial training (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Decision Analytics

Major in Statistics

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6)
STAT1600 Statistics: ideas and concepts (6)
STAT2601 Probability and statistics II (6)
STAT2602 Probability and statistics II (6)
STAT2603 Data management with SAS (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3609 The statistics of investment risk (6)
STAT3615 Practical mathematics for investment (6)

STAT4601 Time-series analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]

STAT3610 Risk management and insurance (6)
STAT3612 Statistical machine learning (6) [previous title: Data mining (6)]

STAT3618 Derivatives and risk management (6) STAT3911 Financial economics II (6)

STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

- 1. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 3. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 4. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 5. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Statistics

Offered to students 2020

admitted to Year 1 in

Objectives:

The Major in Statistics focuses on the study of statistics, a scientific discipline characterized by the development and applications of analytical and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytical and computational skills, which are in great demand in practical areas where data are obtained for the purpose of extracting information in support of decision making. It gives students a strong background in statistical concepts, and provides broad and solid training in applied statistical methodologies. The curriculum is constantly revised to meet a steadily rising demand for specialist statisticians or quantitative analysts in government, business, finance, industry, as well as in research and teaching in local and overseas institutions.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: receive solid training in probability and statistics, gain insight into their underlying theory and be acquainted with their state-of-the-art applications in the modern world (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: conduct meticulous data analyses, supported by rigorous statistical reasoning, to make informed decisions in the face of uncertainty that arises in all sorts of institutions and companies, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: equip with hands-on experience in data analysis using commercial statistical software, and be competent for dataanalytic jobs which require advanced computational skills (by means of coursework, tutorial classes and/or projectbased learning in the curriculum)
- PLO 4: be highly motivated to explore cross-disciplinary applications of statistics in a broad variety of academic or professional areas including, in particular, mathematics, natural sciences, economics, finance, business, risk management, actuarial work, social sciences and engineering (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on probability and statistical issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: through the understanding and application of statistical concepts and techniques, gain confidence to meet challenges posed by increasingly complicated real-life problems encountered in the modern era in a creative and rational manner (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6) STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits from Lists A and B, among which at least 6 credits from List A:

List A
STAT3602 Statistical inference (6)
STAT3604 Design and analysis of experime

STAT3604 Design and analysis of experiments (6)
STAT3620 Modern nonparametric statistics (6)
STAT3621 Statistical data analysis (6)

List B

STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

STAT3607 Statistics in clinical medicine and bio-medical research (6)

STAT3608 Statistical genetics (6)
STAT3612 Statistical machine learning (6)
STAT3613 Marketing analytics (6)
STAT3617 Sample survey methods (6)

STAT3655 Survival analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

1. Students who wish to specialize in the theme of data science are recommended to choose the combination of courses STAT3612, STAT3613 and STAT3621. Note that students who wish to take STAT3621 are strongly recommended to take STAT2603 first.

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.
- 7. Candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.
- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

Remarks:

Major Title Major in Statistics

Offered to students 2019

admitted to Year 1 in

Objectives:

The Major in Statistics focuses on the study of statistics, a scientific discipline characterized by the development and applications of analytical and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytical and computational skills, which are in great demand in practical areas where data are obtained for the purpose of extracting information in support of decision making. It gives students a strong background in statistical concepts, and provides broad and solid training in applied statistical methodologies. The curriculum is constantly revised to meet a steadily rising demand for specialist statisticians or quantitative analysts in government, business, finance, industry, as well as in research and teaching in local and overseas institutions.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: receive solid training in probability and statistics, gain insight into their underlying theory and be acquainted with their state-of-the-art applications in the modern world (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: conduct meticulous data analyses, supported by rigorous statistical reasoning, to make informed decisions in the face of uncertainty that arises in all sorts of institutions and companies, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: equip with hands-on experience in data analysis using commercial statistical software, and be competent for dataanalytic jobs which require advanced computational skills (by means of coursework, tutorial classes and/or projectbased learning in the curriculum)
- PLO 4: be highly motivated to explore cross-disciplinary applications of statistics in a broad variety of academic or professional areas including, in particular, mathematics, natural sciences, economics, finance, business, risk management, actuarial work, social sciences and engineering (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on probability and statistical issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: through the understanding and application of statistical concepts and techniques, gain confidence to meet challenges posed by increasingly complicated real-life problems encountered in the modern era in a creative and rational manner (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6) STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits from Lists A and B, among which at least 6 credits from List A:

List A
STAT3602 Statistical inference (6)
STAT3604 Design and analysis of experiments (6)
STAT3600 Medium papagements estatistics (6)

STAT3604 Design and analysis of experiments (6 STAT3620 Modern nonparametric statistics (6) STAT3621 Statistical data analysis (6)

List B

STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

STAT3607 Statistics in clinical medicine and bio-medical research (6)

STAT3608 Statistical genetics (6)
STAT3612 Statistical machine learning (6)
STAT3613 Marketing analytics (6)
STAT3617 Sample survey methods (6)

STAT3655 Survival analysis (6)

STAT3955 Survival analysis (6)

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusive.

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

1. Students who wish to specialize in the theme of data science are recommended to choose the combination of courses STAT3612, STAT3613 and STAT3621. Note that students who wish to take STAT3621 are strongly recommended to take STAT2603 first.

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Statistics

Offered to students 2018

admitted to Year 1 in

Objectives:

The Major in Statistics focuses on the study of statistics, a scientific discipline characterized by the development and applications of analytical and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytical and computational skills, which are in great demand in practical areas where data are obtained for the purpose of extracting information in support of decision making. It gives students a strong background in statistical concepts, and provides broad and solid training in applied statistical methodologies. The curriculum is constantly revised to meet a steadily rising demand for specialist statisticians or quantitative analysts in government, business, finance, industry, as well as in research and teaching in local and overseas institutions.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: receive solid training in probability and statistics, gain insight into their underlying theory and be acquainted with their state-of-the-art applications in the modern world (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: conduct meticulous data analyses, supported by rigorous statistical reasoning, to make informed decisions in the face of uncertainty that arises in all sorts of institutions and companies, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: equip with hands-on experience in data analysis using commercial statistical software, and be competent for dataanalytic jobs which require advanced computational skills (by means of coursework, tutorial classes and/or projectbased learning in the curriculum)
- PLO 4: be highly motivated to explore cross-disciplinary applications of statistics in a broad variety of academic or professional areas including, in particular, mathematics, natural sciences, economics, finance, business, risk management, actuarial work, social sciences and engineering (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on probability and statistical issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: through the understanding and application of statistical concepts and techniques, gain confidence to meet challenges posed by increasingly complicated real-life problems encountered in the modern era in a creative and rational manner (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6) STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]

STAT4601 Time-series analysis (6)
STAT4602 Multivariate data analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits from Lists A and B, among which at least 6 credits from List A:

List A
STAT3602 Statistical inference (6)
STAT3604 Design and analysis of experiments (6)
STAT3620 Modern nonparametric statistics (6)
STAT3621 Statistical data analysis (6)

List B

STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

STAT3607 Statistics in clinical medicine and bio-medical research (6)

STAT3608 Statistical genetics (6)
STAT3612 Statistical machine learning (6) [previous title: Data mining (6)]

STAT3613 Marketing analytics (6) STAT3617 Sample survey methods (6)

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[previous title: Marketing engineering (6)]

STAT3655 Survival analysis (6)

STAT3955 Survival analysis (6)

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

1. Students who wish to specialize in the theme of data science are recommended to choose the combination of courses STAT3612, STAT3613 and STAT3621. Note that students who wish to take STAT3621 are strongly recommended to take STAT2603 first.

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Statistics

Offered to students 2017

admitted to Year 1 in

Objectives:

The Major in Statistics focuses on the study of statistics, a scientific discipline characterized by the development and applications of analytical and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytical and computational skills, which are in great demand in practical areas where data are obtained for the purpose of extracting information in support of decision making. It gives students a strong background in statistical concepts, and provides broad and solid training in applied statistical methodologies. The curriculum is constantly revised to meet a steadily rising demand for specialist statisticians or quantitative analysts in government, business, finance, industry, as well as in research and teaching in local and overseas institutions.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: receive solid training in probability and statistics, gain insight into their underlying theory and be acquainted with their state-of-the-art applications in the modern world (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: conduct meticulous data analyses, supported by rigorous statistical reasoning, to make informed decisions in the face of uncertainty that arises in all sorts of institutions and companies, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: equip with hands-on experience in data analysis using commercial statistical software, and be competent for dataanalytic jobs which require advanced computational skills (by means of coursework, tutorial classes and/or projectbased learning in the curriculum)
- PLO 4: be highly motivated to explore cross-disciplinary applications of statistics in a broad variety of academic or professional areas including, in particular, mathematics, natural sciences, economics, finance, business, risk management, actuarial work, social sciences and engineering (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on probability and statistical issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: through the understanding and application of statistical concepts and techniques, gain confidence to meet challenges posed by increasingly complicated real-life problems encountered in the modern era in a creative and rational manner (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) Fundamentals of modern science (6) SCNC1112

Disciplinary Core Courses (30 credits)

University mathematics II (6) MATH1013 STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

Probability and statistics I (6) STAT2601 Probability and statistics II (6) STAT2602

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6) STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]

STAT4601 Time-series analysis (6) Multivariate data analysis (6) STAT4602

Disciplinary Electives (24 credits)

At least 24 credits from Lists A and B, among which at least 6 credits from List A:

I ist A Statistical inference (6) STAT3602 STAT3604 Design and analysis of experiments (6) Modern nonparametric statistics (6) STAT3620

STAT3621 Statistical data analysis (6)

List B

Quality control and management (6) STAT3605

Business logistics (6) STAT3606

Statistics in clinical medicine and bio-medical research (6) STAT3607

STAT3608 Statistical genetics (6)

Statistical machine learning (6) STAT3612 [previous title: Data mining (6)]

Marketing analytics (6) [previous title: Marketing engineering (6)] STAT3613 STAT3616 Advanced SAS programming (6)

STAT3617 Sample survey methods (6)

STAT3655 Survival analysis (6)

STAT3955 Survival analysis (6)

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or

STAT3955 are mutually exclusvie.

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

1. Students who wish to specialize in the theme of data science are recommended to choose the combination of courses STAT3612, STAT3613, STAT3616 and STAT3621. Note that students who wish to take STAT3616 and STAT3621 are strongly recommended to take STAT2603 first.

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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Remarks

Major Title Major in Statistics

Offered to students 2016

admitted to Year 1 in

Objectives:

The Major in Statistics focuses on the study of statistics, a scientific discipline characterized by the development and applications of analytical and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytical and computational skills, which are in great demand in practical areas where data are obtained for the purpose of extracting information in support of decision making. It gives students a strong background in statistical concepts, and provides broad and solid training in applied statistical methodologies. The curriculum is constantly revised to meet a steadily rising demand for specialist statisticians or quantitative analysts in government, business, finance, industry, as well as in research and teaching in local and overseas institutions.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: receive solid training in probability and statistics, gain insight into their underlying theory and be acquainted with their state-of-the-art applications in the modern world (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: conduct meticulous data analyses, supported by rigorous statistical reasoning, to make informed decisions in the face of uncertainty that arises in all sorts of institutions and companies, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: equip with hands-on experience in data analysis using commercial statistical software, and be competent for dataanalytic jobs which require advanced computational skills (by means of coursework, tutorial classes and/or projectbased learning in the curriculum)
- PLO 4: be highly motivated to explore cross-disciplinary applications of statistics in a broad variety of academic or professional areas including, in particular, mathematics, natural sciences, economics, finance, business, risk management, actuarial work, social sciences and engineering (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
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Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6) STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]

STAT4601 Time-series analysis (6)
STAT4602 Multivariate data analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits from Lists A and B, among which at least 6 credits from List A:

List A
STAT3602 Statistical inference (6)
STAT3604 Design and analysis of experiments (6)
STAT3620 Modern nonparametric statistics (6)
STAT3621 Statistical data analysis (6)

List B

STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

STAT3607 Statistics in clinical medicine and bio-medical research (6)

STAT3608 Statistical genetics (6)

STAT3612 Statistical machine learning (6) [previous title: Data mining (6)]
STAT3613 Marketing analytics (6) [previous title: Marketing engineering (6)]

STAT3616 Advanced SAS programming (6)

STAT3617 Sample survey methods (6)

STAT3655 Survival analysis (6)

STAT3955 Survival analysis (6)

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

1. Students who wish to specialize in the theme of data science are recommended to choose the combination of courses STAT3612, STAT3613, STAT3616 and STAT3621. Note that students who wish to take STAT3616 and STAT3621 are strongly recommended to take STAT2603 first.

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
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- 5. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Statistics

Offered to students 2015

admitted to Year 1 in

Objectives:

The Major in Statistics focuses on the study of statistics, a scientific discipline characterized by the development and applications of analytical and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytical and computational skills, which are in great demand in practical areas where data are obtained for the purpose of extracting information in support of decision making. It gives students a strong background in statistical concepts, and provides broad and solid training in applied statistical methodologies. The curriculum is constantly revised to meet a steadily rising demand for specialist statisticians or quantitative analysts in government, business, finance, industry, as well as in research and teaching in local and overseas institutions.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: receive solid training in probability and statistics, gain insight into their underlying theory and be acquainted with their state-of-the-art applications in the modern world (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: conduct meticulous data analyses, supported by rigorous statistical reasoning, to make informed decisions in the face of uncertainty that arises in all sorts of institutions and companies, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: equip with hands-on experience in data analysis using commercial statistical software, and be competent for dataanalytic jobs which require advanced computational skills (by means of coursework, tutorial classes and/or projectbased learning in the curriculum)
- PLO 4: be highly motivated to explore cross-disciplinary applications of statistics in a broad variety of academic or professional areas including, in particular, mathematics, natural sciences, economics, finance, business, risk management, actuarial work, social sciences and engineering (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on probability and statistical issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: through the understanding and application of statistical concepts and techniques, gain confidence to meet challenges posed by increasingly complicated real-life problems encountered in the modern era in a creative and rational manner (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6)
STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]

STAT4601 Time-series analysis (6)
STAT4602 Multivariate data analysis (6)

Disciplinary Electives (24 credits)

At least 24 credits from Lists A and B, among which at least 6 credits from List A:

List A
STAT3602 Statistical inference (6)
STAT3604 Design and analysis of experiments (6)
STAT3620 Modern nonparametric statistics (6)
STAT3621 Statistical data analysis (6)

List B

STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

STAT3607 Statistics in clinical medicine and bio-medical research (6)

STAT3608 Statistical genetics (6)

STAT3612 Statistical machine learning (6) [previous title: Data mining (6)]

STAT3613 Marketing analytics (6) [previous title: Marketing engineering (6)]
STAT3616 Advanced SAS programming (6)

STAT3617 Sample survey methods (6)

STAT3655 Survival analysis (6)

STAT3955 Survival analysis (6)

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

1. Students who wish to specialize in the theme of data science are recommended to choose the combination of courses STAT3612, STAT3613, STAT3616 and STAT3621. Note that students who wish to take STAT3616 and STAT3621 are strongly recommended to take STAT2603 first.

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks

Major Title Major in Statistics

Offered to students 2014

admitted to Year 1 in

Objectives:

The Major in Statistics focuses on the study of statistics, a scientific discipline characterized by the development and applications of analytical and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytical and computational skills, which are in great demand in practical areas where data are obtained for the purpose of extracting information in support of decision making. It gives students a strong background in statistical concepts, and provides broad and solid training in applied statistical methodologies. The curriculum is constantly revised to meet a steadily rising demand for specialist statisticians or quantitative analysts in government, business, finance, industry, as well as in research and teaching in local and overseas institutions.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: receive solid training in probability and statistics, gain insight into their underlying theory and be acquainted with their state-of-the-art applications in the modern world (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: conduct meticulous data analyses, supported by rigorous statistical reasoning, to make informed decisions in the face of uncertainty that arises in all sorts of institutions and companies, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: equip with hands-on experience in data analysis using commercial statistical software, and be competent for dataanalytic jobs which require advanced computational skills (by means of coursework, tutorial classes and/or projectbased learning in the curriculum)
- PLO 4: be highly motivated to explore cross-disciplinary applications of statistics in a broad variety of academic or professional areas including, in particular, mathematics, natural sciences, economics, finance, business, risk management, actuarial work, social sciences and engineering (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on probability and statistical issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: through the understanding and application of statistical concepts and techniques, gain confidence to meet challenges posed by increasingly complicated real-life problems encountered in the modern era in a creative and rational manner (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) SCNC1112 Fundamentals of modern science (6)

Disciplinary Courses (30 credits)

MATH1013 University mathematics II (6)
STAT1600 Statistics: ideas and concepts (6)

MATH2014 Multivariable calculus and linear algebra (6)

STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

STAT3600 Linear statistical analysis (6)
STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)]

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6)

Disciplinary Electives (24 credit)

At least 24 credits from Lists A and B, among which at least 6 credits from List A:

List A
STAT3602 Statistical inference (6)
STAT3604 Design and analysis of experiments (6)
STAT3620 Modern nonparametric statistics (6)
STAT3621 Statistical data analysis (6)

List B

STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

STAT3607 Statistics in clinical medicine and bio-medical research (6)

STAT3608 Statistical genetics (6)
STAT3612 Statistical machine learning (6)

STAT3612 Statistical machine learning (6) [previous title: Data mining (6)]
STAT3613 Marketing analytics (6) [previous title: Marketing engineering (6)]

STAT3613 Marketing analytics (6) STAT3616 Advanced SAS programming (6) STAT3617 Sample survey methods (6)

STAT3655 Survival analysis (6)

STAT3955 Survival analysis (6)

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

1. Students who wish to specialize in the theme of data science are recommended to choose the combination of courses STAT3612, STAT3613, STAT3616 and STAT3621. Note that students who wish to take STAT3616 and STAT3621 are strongly recommended to take STAT2603 first.

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks

Major Title Major in Statistics

Offered to students 2013

admitted to Year 1 in

Objectives:

The Major in Statistics focuses on the study of statistics, a scientific discipline characterized by the development and applications of analytical and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytical and computational skills, which are in great demand in practical areas where data are obtained for the purpose of extracting information in support of decision making. It gives students a strong background in statistical concepts, and provides broad and solid training in applied statistical methodologies. The curriculum is constantly revised to meet a steadily rising demand for specialist statisticians or quantitative analysts in government, business, finance, industry, as well as in research and teaching in local and overseas institutions.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: receive solid training in probability and statistics, gain insight into their underlying theory and be acquainted with their state-of-the-art applications in the modern world (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: conduct meticulous data analyses, supported by rigorous statistical reasoning, to make informed decisions in the face of uncertainty that arises in all sorts of institutions and companies, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: equip with hands-on experience in data analysis using commercial statistical software, and be competent for dataanalytic jobs which require advanced computational skills (by means of coursework, tutorial classes and/or projectbased learning in the curriculum)
- PLO 4: be highly motivated to explore cross-disciplinary applications of statistics in a broad variety of academic or professional areas including, in particular, mathematics, natural sciences, economics, finance, business, risk management, actuarial work, social sciences and engineering (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on probability and statistical issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: through the understanding and application of statistical concepts and techniques, gain confidence to meet challenges posed by increasingly complicated real-life problems encountered in the modern era in a creative and rational manner (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Decision Analytics

Major in Risk Management

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) **SCNC1112** Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6) Statistics: ideas and concepts (6) STAT1600 STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6) STAT2603 Data management with SAS (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

Linear statistical analysis (6) STAT3600 STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)] STAT4601 Time-series analysis (6)

Multivariate data analysis (6) STAT4602

Disciplinary Electives (24 credits)

At least 24 credits from Lists A and B, among which at least 6 credits from List A:

STAT3602 Statistical inference (6) Design and analysis of experiments (6) STAT3604 Modern nonparametric statistics (6) STAT3620 Statistical data analysis (6) STAT3621

List B

STAT3608

List A

STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

STAT3607 Statistics in clinical medicine and bio-medical research (6) Statistical genetics (6)

STAT3612 Statistical machine learning (6) [previous title: Data mining (6)] [previous title: Marketing engineering (6)] STAT3613 Marketing analytics (6) Advanced SAS programming (6)

STAT3616 STAT3617 Sample survey methods (6) STAT3655 Survival analysis (6)

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or

STAT3955 are mutually exclusvie.

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

STAT3955 Survival analysis (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

1. Students who wish to specialize in the theme of data science are recommended to choose the combination of courses STAT3612, STAT3613, STAT3616 and STAT3621. Note that students who wish to take STAT3616 and STAT3621 are strongly recommended to take STAT2603 first.

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Major Title Major in Statistics

Offered to students 2012

admitted to Year 1 in

Objectives:

The Major in Statistics focuses on the study of statistics, a scientific discipline characterized by the development and applications of analytical and quantitative tools which involve logical thinking, problem formulation, probability reasoning and intensive data analyses. The programme aims to equip students with powerful mathematical, analytical and computational skills, which are in great demand in practical areas where data are obtained for the purpose of extracting information in support of decision making. It gives students a strong background in statistical concepts, and provides broad and solid training in applied statistical methodologies. The curriculum is constantly revised to meet a steadily rising demand for specialist statisticians or quantitative analysts in government, business, finance, industry, as well as in research and teaching in local and overseas institutions.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: receive solid training in probability and statistics, gain insight into their underlying theory and be acquainted with their state-of-the-art applications in the modern world (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 2: conduct meticulous data analyses, supported by rigorous statistical reasoning, to make informed decisions in the face of uncertainty that arises in all sorts of institutions and companies, and appraise the related ethical issues (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 3: equip with hands-on experience in data analysis using commercial statistical software, and be competent for dataanalytic jobs which require advanced computational skills (by means of coursework, tutorial classes and/or projectbased learning in the curriculum)
- PLO 4: be highly motivated to explore cross-disciplinary applications of statistics in a broad variety of academic or professional areas including, in particular, mathematics, natural sciences, economics, finance, business, risk management, actuarial work, social sciences and engineering (by means of coursework, tutorial classes and/or project-based learning in the curriculum)
- PLO 5: communicate and collaborate with people effectively on probability and statistical issues (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)
- PLO 6: through the understanding and application of statistical concepts and techniques, gain confidence to meet challenges posed by increasingly complicated real-life problems encountered in the modern era in a creative and rational manner (by means of coursework, tutorial classes, project-based and/or capstone learning in the curriculum)

Impermissible Combinations:

Major in Decision Analytics

Major in Risk Management

Minor in Risk Management

Minor in Statistics

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

SCNC1111 Scientific method and reasoning (6) **SCNC1112** Fundamentals of modern science (6)

Disciplinary Core Courses (30 credits)

MATH1013 University mathematics II (6) Statistics: ideas and concepts (6) STAT1600 STAT2601 Probability and statistics I (6) STAT2602 Probability and statistics II (6) STAT2603 Data management with SAS (6)

2. Advanced level courses (48 credits)

Disciplinary Core Courses (24 credits)

Linear statistical analysis (6) STAT3600 STAT3603 Stochastic processes (6) [previous title: Probability modelling (6)] STAT4601 Time-series analysis (6)

Multivariate data analysis (6) STAT4602

Disciplinary Electives (24 credits)

At least 24 credits from Lists A and B, among which at least 6 credits from List A:

STAT3602 Statistical inference (6) Design and analysis of experiments (6) STAT3604 Modern nonparametric statistics (6) STAT3620 Statistical data analysis (6) STAT3621

List B

STAT3608

List A

STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

STAT3607 Statistics in clinical medicine and bio-medical research (6) Statistical genetics (6)

STAT3612 Statistical machine learning (6) [previous title: Data mining (6)] [previous title: Marketing engineering (6)] STAT3613 Marketing analytics (6) Advanced SAS programming (6)

STAT3616 STAT3617 Sample survey methods (6) STAT3655 Survival analysis (6)

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or

STAT3955 are mutually exclusvie.

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or

STAT3955 are mutually exclusvie.

3. Capstone requirement (6 credits)

STAT3955

At least 6 credits selected from the following courses:

Survival analysis (6)

STAT3799 Directed studies in statistics (6)

STAT4710 Capstone experience for statistics undergraduates (6)

STAT4766 Statistics internship (6) STAT4799 Statistics project (12)

Notes:

1. Students who wish to specialize in the theme of data science are recommended to choose the combination of courses STAT3612, STAT3613, STAT3616 and STAT3621. Note that students who wish to take STAT3616 and STAT3621 are strongly recommended to take STAT2603 first.

- 2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major opts to undertake a second major in science. The double-counted courses must include SCNC1111 Scientific method and reasoning (6 credits) and SCNC1112 Fundamentals of modern science (6 credits). Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 3. If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ("disciplinary core") in both the first and second majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) (disciplinary electives) in the second major. Double counting of credits is not permissible for major-minor or double-minors combinations. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 4. Students are not required to take Capstone if this Science major is taken as a second major on the condition that the capstone experience in the first major requires the integration or application of knowledge from both major disciplines. If this is approved, a 6-credit advanced level course (disciplinary electives) in the second major must be taken to fulfill the credit requirement of the capstone experience.
- 5. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 6. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Science Minors 2020-2021

SCIENCE

SECTION VII Science Minors on offer in 2020/2021

Minors offered by Science Faculty

Minors

Actuarial Studies (not for BSc(ActuarSc) students)

Astronomy

Biochemistry

Chemistry

Computational & Financial Mathematics

Earth Sciences

Ecology & Biodiversity

Environmental Science

Food & Nutritional Science

Marine Biology

Mathematics

Molecular Biology & Biotechnology

Operations Research & Mathematical Programming

Physics

Plant Science

Risk Management

Science Entrepreneurship (for 2017 cohort and thereafter)

Statistics

Offered to students 2020

admitted to Year 1 in

Objectives:

The Minor in Actuarial Studies aims to provide interested students with an introduction to the basic concepts and methodologies in Actuarial Science. The minor curriculum is designed particularly for students from different majors to enhance their interests in Actuarial Science and to strengthen their confidence and potential in solving mathematical, financial, economical and investment-related problems.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and apply the methods used by actuaries to solve problems of insurance, investment, pension, financial risk management and demography (by means of coursework and tutorial classes and/or research-based project in the curriculum)
- PLO 2: develop and apply problem-solving skills appropriate to the level of the preliminary education component specified by international actuarial bodies such as the Society of Actuaries (by means of coursework and tutorial classes and/or research-based project in the curriculum)

Impermissible Combinations:

Bachelor of Science in Actuarial Science

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

FINA1310 Corporate finance (6)
MATH1013 University mathematics II (6)
STAT2601 Probability and statistics I (6)
STAT2602 Probability and statistics II (6)

STAT2605 Demographic and socio-economic statistics (6)

STAT2901 Probability and statistics: foundations of actuarial science (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

STAT3615 Practical mathematics for investment (6)

STAT3901 Life contingencies I (6)

STAT3904 Corporate finance for actuarial science (6)

STAT3906 Risk theory I (6)

STAT3908 Credibility theory and loss distributions (6)

STAT3910 Financial economics I (6) STAT3911 Financial economics II (6)

STAT3953 Fundamentals of actuarial practice (6) STAT4903 Actuarial techniques for general insurance (6)

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2019

admitted to Year 1 in

Objectives:

The Minor in Actuarial Studies aims to provide interested students with an introduction to the basic concepts and methodologies in Actuarial Science. The minor curriculum is designed particularly for students from different majors to enhance their interests in Actuarial Science and to strengthen their confidence and potential in solving mathematical, financial, economical and investment-related problems.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and apply the methods used by actuaries to solve problems of insurance, investment, pension, financial risk management and demography (by means of coursework and tutorial classes and/or research-based project in the curriculum)
- PLO 2: develop and apply problem-solving skills appropriate to the level of the preliminary education component specified by international actuarial bodies such as the Society of Actuaries (by means of coursework and tutorial classes and/or research-based project in the curriculum)

Impermissible Combinations:

Bachelor of Science in Actuarial Science

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

FINA1310 Corporate finance (6)
MATH1013 University mathematics II (6)
STAT2601 Probability and statistics I (6)
STAT2602 Probability and statistics II (6)

STAT2605 Demographic and socio-economic statistics (6)

STAT2901 Probability and statistics: foundations of actuarial science (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

STAT3615 Practical mathematics for investment (6)

STAT3901 Life contingencies I (6)

STAT3904 Corporate finance for actuarial science (6)

STAT3906 Risk theory I (6)

STAT3908 Credibility theory and loss distributions (6)

STAT3910 Financial economics I (6) STAT3911 Financial economics II (6)

STAT3953 Fundamentals of actuarial practice (6)
STAT4903 Actuarial techniques for general insurance (6)

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

2018

Offered to students

admitted to Year 1 in

Objectives:

The Minor in Actuarial Studies aims to provide interested students with an introduction to the basic concepts and methodologies in Actuarial Science. The minor curriculum is designed particularly for students from different majors to enhance their interests in Actuarial Science and to strengthen their confidence and potential in solving mathematical, financial, economical and investment-related problems.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and apply the methods used by actuaries to solve problems of insurance, investment, pension, financial risk management and demography (by means of coursework and tutorial classes and/or research-based project in the curriculum)
- PLO 2: develop and apply problem-solving skills appropriate to the level of the preliminary education component specified by international actuarial bodies such as the Society of Actuaries (by means of coursework and tutorial classes and/or research-based project in the curriculum)

Impermissible Combinations:

Bachelor of Science in Actuarial Science

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

FINA1310 Corporate finance (6)
MATH1013 University mathematics II (6)
STAT2601 Probability and statistics I (6)
STAT2602 Probability and statistics II (6)

STAT2605 Demographic and socio-economic statistics (6)

STAT2901 Probability and statistics: foundations of actuarial science (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

STAT3615 Practical mathematics for investment (6)

STAT3901 Life contingencies I (6)

STAT3904 Corporate finance for actuarial science (6)

STAT3906 Risk theory I (6)

STAT3908 Credibility theory and loss distributions (6)

STAT3910 Financial economics I (6) STAT3911 Financial economics II (6)

STAT3953 Fundamentals of actuarial practice (6) STAT4903 Actuarial techniques for general insurance (6)

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2017

admitted to Year 1 in

Objectives:

The Minor in Actuarial Studies aims to provide interested students with an introduction to the basic concepts and methodologies in Actuarial Science. The minor curriculum is designed particularly for students from different majors to enhance their interests in Actuarial Science and to strengthen their confidence and potential in solving mathematical, financial, economical and investment-related problems.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and apply the methods used by actuaries to solve problems of insurance, investment, pension, financial risk management and demography (by means of coursework and tutorial classes and/or research-based project in the curriculum)
- PLO 2: develop and apply problem-solving skills appropriate to the level of the preliminary education component specified by international actuarial bodies such as the Society of Actuaries (by means of coursework and tutorial classes and/or research-based project in the curriculum)

Impermissible Combinations:

Bachelor of Science in Actuarial Science

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

FINA1310 Corporate finance (6)
MATH1013 University mathematics II (6)
STAT2601 Probability and statistics I (6)
STAT2602 Probability and statistics II (6)

STAT2605 Demographic and socio-economic statistics (6)

STAT2901 Probability and statistics: foundations of actuarial science (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

STAT3615 Practical mathematics for investment (6)

STAT3901 Life contingencies I (6)

STAT3904 Corporate finance for actuarial science (6)

STAT3906 Risk theory I (6)

STAT3908 Credibility theory and loss distributions (6)

STAT3910 Financial economics I (6) STAT3911 Financial economics II (6)

STAT3953 Fundamentals of actuarial practice (6) STAT4903 Actuarial techniques for general insurance (6)

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

2016

Offered to students

admitted to Year 1 in

Objectives:

The Minor in Actuarial Studies aims to provide interested students with an introduction to the basic concepts and methodologies in Actuarial Science. The minor curriculum is designed particularly for students from different majors to enhance their interests in Actuarial Science and to strengthen their confidence and potential in solving mathematical, financial, economical and investment-related problems.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and apply the methods used by actuaries to solve problems of insurance, investment, pension, financial risk management and demography (by means of coursework and tutorial classes and/or research-based project in the curriculum)
- PLO 2: develop and apply problem-solving skills appropriate to the level of the preliminary education component specified by international actuarial bodies such as the Society of Actuaries (by means of coursework and tutorial classes and/or research-based project in the curriculum)

Impermissible Combinations:

Bachelor of Science in Actuarial Science

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

FINA1310 Corporate finance (6)
MATH1013 University mathematics II (6)
STAT2601 Probability and statistics I (6)
STAT2602 Probability and statistics II (6)

STAT2605 Demographic and socio-economic statistics (6)

STAT2901 Probability and statistics: foundations of actuarial science (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

STAT3615 Practical mathematics for investment (6)

STAT3901 Life contingencies I (6)

STAT3904 Corporate finance for actuarial science (6)

STAT3906 Risk theory I (6)

STAT3908 Credibility theory and loss distributions (6)

STAT3910 Financial economics I (6) STAT3911 Financial economics II (6)

STAT3953 Fundamentals of actuarial practice (6) STAT4903 Actuarial techniques for general insurance (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

2015

Offered to students

admitted to Year 1 in

Objectives:

The Minor in Actuarial Studies aims to provide interested students with an introduction to the basic concepts and methodologies in Actuarial Science. The minor curriculum is designed particularly for students from different majors to enhance their interests in Actuarial Science and to strengthen their confidence and potential in solving mathematical, financial, economical and investment-related problems.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and apply the methods used by actuaries to solve problems of insurance, investment, pension, financial risk management and demography (by means of coursework and tutorial classes and/or research-based project in the curriculum)
- PLO 2: develop and apply problem-solving skills appropriate to the level of the preliminary education component specified by international actuarial bodies such as the Society of Actuaries (by means of coursework and tutorial classes and/or research-based project in the curriculum)

Impermissible Combinations:

Bachelor of Science in Actuarial Science

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

FINA1310 Corporate finance (6)
MATH1013 University mathematics II (6)
STAT2601 Probability and statistics I (6)
STAT2602 Probability and statistics II (6)

STAT2605 Demographic and socio-economic statistics (6)

STAT2901 Probability and statistics: foundations of actuarial science (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

STAT3615 Practical mathematics for investment (6)

STAT3901 Life contingencies I (6)

STAT3904 Corporate finance for actuarial science (6)

STAT3906 Risk theory I (6)

STAT3908 Credibility theory and loss distributions (6)

STAT3910 Financial economics I (6) STAT3911 Financial economics II (6)

STAT3953 Fundamentals of actuarial practice (6) STAT4903 Actuarial techniques for general insurance (6)

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2014

admitted to Year 1 in

Objectives:

The Minor in Actuarial Studies aims to provide interested students with an introduction to the basic concepts and methodologies in Actuarial Science. The minor curriculum is designed particularly for students from different majors to enhance their interests in Actuarial Science and to strengthen their confidence and potential in solving mathematical, financial, economical and investment-related problems.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and apply the methods used by actuaries to solve problems of insurance, investment, pension, financial risk management and demography (by means of coursework and tutorial classes and/or research-based project in the curriculum)
- PLO 2: develop and apply problem-solving skills appropriate to the level of the preliminary education component specified by international actuarial bodies such as the Society of Actuaries (by means of coursework and tutorial classes and/or research-based project in the curriculum)

Impermissible Combinations:

Bachelor of Science in Actuarial Science

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

FINA1310 Corporate finance (6)
MATH1013 University mathematics II (6)
STAT2601 Probability and statistics I (6)
STAT2602 Probability and statistics II (6)

STAT2605 Demographic and socio-economic statistics (6)

STAT2901 Probability and statistics: foundations of actuarial science (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

STAT3615 Practical mathematics for investment (6)

STAT3901 Life contingencies I (6)

STAT3904 Corporate finance for actuarial science (6)

STAT3906 Risk theory I (6)

STAT3908 Credibility theory and loss distributions (6)

STAT3910 Financial economics I (6) STAT3911 Financial economics II (6)

STAT3953 Fundamentals of actuarial practice (6) STAT4903 Actuarial techniques for general insurance (6)

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2013

admitted to Year 1 in

Objectives:

The Minor in Actuarial Studies aims to provide interested students with an introduction to the basic concepts and methodologies in Actuarial Science. The minor curriculum is designed particularly for students from different majors to enhance their interests in Actuarial Science and to strengthen their confidence and potential in solving mathematical, financial, economical and investment-related problems.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and apply the methods used by actuaries to solve problems of insurance, investment, pension, financial risk management and demography (by means of coursework and tutorial classes and/or research-based project in the curriculum)
- PLO 2: develop and apply problem-solving skills appropriate to the level of the preliminary education component specified by international actuarial bodies such as the Society of Actuaries (by means of coursework and tutorial classes and/or research-based project in the curriculum)

Impermissible Combinations:

Bachelor of Science in Actuarial Science

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

FINA1310 Corporate finance (6)
MATH1013 University mathematics II (6)
STAT2601 Probability and statistics I (6)
STAT2602 Probability and statistics II (6)

STAT2605 Demographic and socio-economic statistics (6)

STAT2901 Probability and statistics: foundations of actuarial science (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

STAT3615 Practical mathematics for investment (6)

STAT3901 Life contingencies I (6)

STAT3904 Corporate finance for actuarial science (6)

STAT3906 Risk theory I (6)

STAT3908 Credibility theory and loss distributions (6)

STAT3910 Financial economics I (6) STAT3911 Financial economics II (6)

STAT3953 Fundamentals of actuarial practice (6) STAT4903 Actuarial techniques for general insurance (6)

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2012

admitted to Year 1 in

Objectives:

The Minor in Actuarial Studies aims to provide interested students with an introduction to the basic concepts and methodologies in Actuarial Science. The minor curriculum is designed particularly for students from different majors to enhance their interests in Actuarial Science and to strengthen their confidence and potential in solving mathematical, financial, economical and investment-related problems.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and apply the methods used by actuaries to solve problems of insurance, investment, pension, financial risk management and demography (by means of coursework and tutorial classes and/or research-based project in the curriculum)
- PLO 2: develop and apply problem-solving skills appropriate to the level of the preliminary education component specified by international actuarial bodies such as the Society of Actuaries (by means of coursework and tutorial classes and/or research-based project in the curriculum)

Impermissible Combinations:

Bachelor of Science in Actuarial Science

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

FINA1310 Corporate finance (6)
MATH1013 University mathematics II (6)
STAT2601 Probability and statistics I (6)
STAT2602 Probability and statistics II (6)

STAT2605 Demographic and socio-economic statistics (6)

STAT2901 Probability and statistics: foundations of actuarial science (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

STAT3615 Practical mathematics for investment (6)

STAT3901 Life contingencies I (6)

STAT3904 Corporate finance for actuarial science (6)

STAT3906 Risk theory I (6)

STAT3908 Credibility theory and loss distributions (6)

STAT3910 Financial economics I (6) STAT3911 Financial economics II (6)

STAT3953 Fundamentals of actuarial practice (6) STAT4903 Actuarial techniques for general insurance (6)

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2020

admitted to Year 1 in

Objectives:

The Minor in Astronomy is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses to allow them to pursue their interests in the subject and to establish connections between the field of astronomy and other science disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: develop their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and opportunities of field activities in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Required courses (36 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (12 credits)

Nature of the universe (6) PHYS1650 Modern astronomy (6) PHYS2650

Disciplinary Electives (6 credits)

At least 6 credits selected from the following courses:

PHYS1250 Fundamental physics (6) PHYS2055 Introductory relativity (6)

Introductory computational physics (6) PHYS2160

EASC2408 Planetary geology (6) 2. Advanced level courses (18 credits)

Disciplinary Core Courses (6 credits)

Observational astronomy (6) PHYS3650

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

PHYS3653 Astrophysics (6) Astronomy laboratory (6) PHYS3660 PHYS4650 Stellar physics (6) Planetary science (6) PHYS4652 **PHYS4653** Cosmology (6)

General relativity (6) **PHYS4654** Interstellar medium (6) PHYS4655 PHYS4656 Advanced astrophysics (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc
- 2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

Offered to students 2019

admitted to Year 1 in

Objectives:

The Minor in Astronomy is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses to allow them to pursue their interests in the subject and to establish connections between the field of astronomy and other science disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: develop their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and opportunities of field activities in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Required courses (36 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (12 credits)

Nature of the universe (6) PHYS1650 Modern astronomy (6) PHYS2650

Disciplinary Electives (6 credits)

At least 6 credits selected from the following courses:

PHYS1250 Fundamental physics (6) PHYS2055 Introductory relativity (6)

Introductory computational physics (6) PHYS2160

EASC2408 Planetary geology (6) 2. Advanced level courses (18 credits)

Disciplinary Core Courses (6 credits)

Observational astronomy (6) PHYS3650

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

PHYS3653 Astrophysics (6) Astronomy laboratory (6) PHYS3660 PHYS4650 Stellar physics (6) Planetary science (6) PHYS4652 **PHYS4653** Cosmology (6) General relativity (6) **PHYS4654** Interstellar medium (6)

PHYS4655 PHYS4656 Advanced astrophysics (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc
- 2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

[previous title: Introduction to relativity (6)]

Minor Title Minor in Astronomy

Offered to students 2018

admitted to Year 1 in

Objectives:

The Minor in Astronomy is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses to allow them to pursue their interests in the subject and to establish connections between the field of astronomy and other science disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: develop their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and opportunities of field activities in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

NIL

Required courses (36 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (12 credits)

PHYS1650 Nature of the universe (6) PHYS2650 Modern astronomy (6)

Disciplinary Electives (6 credits)

At least 6 credits selected from the following courses:

PHYS1250 Fundamental physics (6) PHYS2055 Introductory relativity (6)

EASC2408 Planetary geology (6)

2. Advanced level courses (18 credits) Disciplinary Core Courses (6 credits)

PHYS3650 Observational astronomy (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

PHYS3653 Astrophysics (6) **PHYS3660** Astronomy laboratory (6) Stellar physics (6) **PHYS4650** PHYS4652 Planetary science (6) Cosmology (6) PHYS4653 **PHYS4654** General relativity (6) **PHYS4655** Interstellar medium (6) **PHYS4656** Advanced astrophysics (6)

Notes

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses
- 2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

Offered to students 2017

admitted to Year 1 in

Objectives:

The Minor in Astronomy is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses to allow them to pursue their interests in the subject and to establish connections between the field of astronomy and other science disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: develop their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and opportunities of field activities in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Astronomy

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (18 credits)

PHYS1250 Fundamental physics (6)
PHYS1650 Nature of the universe (6)
PHYS2265 Introductory quantum physics (6)

[previous title: Modern physics (6)]

2. Advanced level courses (24 credits) Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)
PHYS3653 Astrophysics (6)

PHYS3660 Astronomy laboratory (6)

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)
PHYS4653 Cosmology (6)
PHYS4654 General relativity (6)
PHYS4655 Interstellar medium (6)
PHYS4656 Advanced astrophysics (6)
PHYS7650 Stellar atmospheres (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

Offered to students 2016

admitted to Year 1 in

Objectives:

The Minor in Astronomy is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses to allow them to pursue their interests in the subject and to establish connections between the field of astronomy and other science disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: develop their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and opportunities of field activities in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Astronomy

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (18 credits)

PHYS1250 Fundamental physics (6)
PHYS1650 Nature of the universe (6)
PHYS2265 Introductory quantum physics (6)

[previous title: Modern physics (6)]

2. Advanced level courses (24 credits) Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)
PHYS3653 Astrophysics (6)
PHYS3660 Astronomy laboratory (6)

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)
PHYS4653 Cosmology (6)
PHYS4654 General relativity (6)
PHYS4655 Interstellar medium (6)
PHYS4656 Advanced astrophysics (6)
PHYS7650 Stellar atmospheres (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

Offered to students 2015

admitted to Year 1 in

Objectives:

The Minor in Astronomy is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses to allow them to pursue their interests in the subject and to establish connections between the field of astronomy and other science disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: develop their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and opportunities of field activities in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Astronomy

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (18 credits)

PHYS1250 Fundamental physics (6)
PHYS1650 Nature of the universe (6)
PHYS2365 Introductor quantum physics

PHYS2265 Introductory quantum physics (6) [previous title: Modern physics (6)]

2. Advanced level courses (24 credits) Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)
PHYS3653 Astrophysics (6)

PHYS3660 Astronomy laboratory (6)

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)
PHYS4653 Cosmology (6)
PHYS4654 General relativity (6)
PHYS4655 Interstellar medium (6)
PHYS4656 Advanced astrophysics (6)
PHYS7650 Stellar atmospheres (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

[previous title: Modern physics (6)]

Minor Title Minor in Astronomy

Offered to students 2014

admitted to Year 1 in

Objectives:

The Minor in Astronomy is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses to allow them to pursue their interests in the subject and to establish connections between the field of astronomy and other science disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: develop their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and opportunities of field activities in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Astronomy

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (18 credits)

Fundamental physics (6) PHYS1250 Nature of the universe (6) PHYS1650 **PHYS2265** Introductory quantum physics (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

Observational astronomy (6) PHYS3650 PHYS3651 The physical universe (6) **PHYS3652** Principles of astronomy (6)

PHYS4650 Stellar physics (6)

Selected topics in astrophysics (6) PHYS4651

Planetary science (6) PHYS4652 PHYS4653 Cosmology (6) **PHYS4654** General relativity (6) Interstellar medium (6) **PHYS4655 PHYS7650** Stellar atmospheres (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Offered to students 2013

admitted to Year 1 in

Objectives:

The Minor in Astronomy is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses to allow them to pursue their interests in the subject and to establish connections between the field of astronomy and other science disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: develop their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and opportunities of field activities in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Astronomy

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (18 credits)

PHYS1250 Fundamental physics (6)
PHYS1650 Nature of the universe (6)
PHYS2265 Introductory quantum physics (6)

[previous title: Modern physics (6)]

2. Advanced level courses (24 credits) Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)
PHYS4653 Cosmology (6)
PHYS4654 General relativity (6)
PHYS4655 Interstellar medium (6)
PHYS7650 Stellar atmospheres (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

[previous title: Modern physics (6)]

Minor Title Minor in Astronomy

Offered to students 2012

admitted to Year 1 in

Objectives:

The Minor in Astronomy is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses to allow them to pursue their interests in the subject and to establish connections between the field of astronomy and other science disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe astrophysical phenomena with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: develop their scientific intuition, abilities and techniques to tackle astrophysical problems either theoretical or observational in nature (by means of coursework, tutorial classes, and opportunities of field activities in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Astronomy

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (18 credits)

PHYS1250 Fundamental physics (6)
PHYS1650 Nature of the universe (6)
PHYS2265 Introductory quantum physics (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)
PHYS4653 Cosmology (6)
PHYS4654 General relativity (6)
PHYS4655 Interstellar medium (6)
PHYS7650 Stellar atmospheres (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

Minor Title Minor in Biochemistry

Offered to students 2020

admitted to Year 1 in

Objectives:

The Minor in Biochemistry is designed to provide students from all backgrounds with a multidisciplinary perspective on contemporary biochemistry and molecular biology. This minor curriculum incorporates significant flexibility to allow students to select courses that will complement the individual student's Major.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the fundamentals of biochemistry and molecular biology, and apply biochemical knowledge appropriately and effectively (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: integrate knowledge regarding the structure and function of biological molecules and how they come together to form the systems that make up life (by means of coursework and laboratory-based learning in the curriculum)
- PLO 3: develop a general interest in biochemistry and recognize the inter-relationship of biochemistry with other disciplines (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Biochemistry

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:
BIOC1600 Perspectives in biochemistry (6)
BIOL1110 From molecules to cells (6)

BIOC2600 Basic biochemistry (6)

Take either BIOC2600 or BIOL2220 to fulfill this 12 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive.

BIOL2220 Principles of biochemistry (6)

Take either BIOC2600 or BIOL2220 to fulfill this 12 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive.

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOC3601 Basic metabolism (6)
BIOC3604 Basic metabolism (6)
Essential techniques in biochemistry and molecular biology (6)

BIOC3605 Sequence bioinformatics (6)
BIOC3606 Molecular medicine (6)

BIOC3606 Molecular medicine (6)
BIOL3202 Nutritional biochemistry (6)
BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)
BIOC4610 Advanced biochemistry (6)
BIOC4612 Molecular biology of the gene (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

BIOL4417 'Omics' and systems biology (6)

CHEM4444 Chemical biology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Biochemistry

Offered to students 2019

admitted to Year 1 in

Objectives:

The Minor in Biochemistry is designed to provide students from all backgrounds with a multidisciplinary perspective on contemporary biochemistry and molecular biology. This minor curriculum incorporates significant flexibility to allow students to select courses that will complement the individual student's Major.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the fundamentals of biochemistry and molecular biology, and apply biochemical knowledge appropriately and effectively (by means of coursework and laboratory-based learning in the curriculum)
- integrate knowledge regarding the structure and function of biological molecules and how they come together to form the systems that make up life (by means of coursework and laboratory-based learning in the curriculum)
- PLO 3: develop a general interest in biochemistry and recognize the inter-relationship of biochemistry with other disciplines (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Biochemistry

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: Perspectives in biochemistry (6) BIOC1600 From molecules to cells (6) BIOL1110 **BIOC2600** Basic biochemistry (6)

Take either BIOC2600 or BIOL2220 to fulfill this 12 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive.

BIOL2220 Principles of biochemistry (6) Take either BIOC2600 or BIOL2220 to fulfill this 12 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive.

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses: BIOC3601 Basic metabolism (6)

BIOC3604 Essential techniques in biochemistry and molecular biology (6) **BIOC3605** Sequence bioinformatics (6) Molecular medicine (6) **BIOC3606**

BIOL3202 Nutritional biochemistry (6) BIOL3401 Molecular biology (6)

Cell biology and cell technology (6) **BIOL3402**

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6) BIOC4610 Advanced biochemistry (6) BIOC4612 Molecular biology of the gene (6)

Advanced techniques in biochemistry & molecular biology (6) **BIOC4613**

BIOL4417 'Omics' and systems biology (6)

CHEM4444 Chemical biology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Biochemistry

Offered to students 2018

admitted to Year 1 in

Objectives:

The Minor in Biochemistry is designed to provide students from all backgrounds with a multidisciplinary perspective on contemporary biochemistry and molecular biology. This minor curriculum incorporates significant flexibility to allow students to select courses that will complement the individual student's Major.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the fundamentals of biochemistry and molecular biology, and apply biochemical knowledge appropriately and effectively (by means of coursework and laboratory-based learning in the curriculum)
- integrate knowledge regarding the structure and function of biological molecules and how they come together to form the systems that make up life (by means of coursework and laboratory-based learning in the curriculum)
- PLO 3: develop a general interest in biochemistry and recognize the inter-relationship of biochemistry with other disciplines (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Biochemistry

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: Perspectives in biochemistry (6) BIOC1600 From molecules to cells (6) BIOL1110 **BIOC2600** Basic biochemistry (6)

Take either BIOC2600 or BIOL2220 to fulfill this 12 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive.

BIOL2220 Principles of biochemistry (6) Take either BIOC2600 or BIOL2220 to fulfill this 12 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive.

2. Advanced level courses (24 credits) **Disciplinary Electives (24 credits)**

At least 24 credits selected from the following courses:

BIOC3601 Basic metabolism (6)

BIOC3604 Essential techniques in biochemistry and molecular biology (6)

BIOC3605 Sequence bioinformatics (6) Molecular medicine (6) **BIOC3606** BIOL3202 Nutritional biochemistry (6) BIOL3401 Molecular biology (6)

Cell biology and cell technology (6) **BIOL3402**

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6) BIOC4610 Advanced biochemistry (6) BIOC4612 Molecular biology of the gene (6)

Advanced techniques in biochemistry & molecular biology (6) **BIOC4613**

BIOL4417 'Omics' and systems biology (6)

CHEM4444 Chemical biology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Biochemistry

Offered to students 2017

admitted to Year 1 in

Objectives:

The Minor in Biochemistry is designed to provide students from all backgrounds with a multidisciplinary perspective on contemporary biochemistry and molecular biology. This minor curriculum incorporates significant flexibility to allow students to select courses that will complement the individual student's Major.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the fundamentals of biochemistry and molecular biology, and apply biochemical knowledge appropriately and effectively (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: integrate knowledge regarding the structure and function of biological molecules and how they come together to form the systems that make up life (by means of coursework and laboratory-based learning in the curriculum)
- PLO 3: develop a general interest in biochemistry and recognize the inter-relationship of biochemistry with other disciplines (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Biochemistry

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:
BIOC1600 Perspectives in biochemistry (6)
BIOL1110 From molecules to cells (6)
BIOC2600 Basic biochemistry (6)

Take either BIOC2600 or BIOL2220 to fulfill this 12 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive.

BIOL2220 Principles of biochemistry (6)

Take either BIOC2600 or BIOL2220 to fulfill this 12 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually exclusive.

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses: BIOC3601 Basic metabolism (6)

BIOC3604 Essential techniques in biochemistry and molecular biology (6)
BIOC3605 Sequence bioinformatics (6)

BIOC3606 Melocular modicine (6)

BIOC3606 Molecular medicine (6)
BIOL3202 Nutritional biochemistry (6)
BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)
BIOC4610 Advanced biochemistry (6)
BIOC4612 Molecular biology of the gene (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

BIOL4417 'Omics' and systems biology (6)

CHEM4444 Chemical biology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Biochemistry

Offered to students

2016

admitted to Year 1 in

Objectives:

The Minor in Biochemistry is designed to provide students from all backgrounds with a multidisciplinary perspective on contemporary biochemistry and molecular biology. This minor curriculum incorporates significant flexibility to allow students to select courses that will complement the individual student's Major.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the fundamentals of biochemistry and molecular biology, and apply biochemical knowledge appropriately and effectively (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: integrate knowledge regarding the structure and function of biological molecules and how they come together to form the systems that make up life (by means of coursework and laboratory-based learning in the curriculum)
- PLO 3: develop a general interest in biochemistry and recognize the inter-relationship of biochemistry with other disciplines (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Biochemistry

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:
BIOC1600 Perspectives in biochemistry (6)
BIOL1110 From molecules to cells (6)
BIOC2600 Basic biochemistry (6)

Take either BIOC2600 or BIOL2220 to fulfill this 12 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive.

BIOL2220 Principles of biochemistry (6)

Take either BIOC2600 or BIOL2220 to fulfill this 12 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive.

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOC3601 Basic metabolism (6)
BIOC3604 Basic metabolism (6)
Essential techniques in biochemistry and molecular biology (6)

BIOC3605 Sequence bioinformatics (6)
BIOC3606 Molecular medicine (6)
BIOL3202 Nutritional biochemistry (6)
BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)
BIOC4610 Advanced biochemistry (6)
BIOC4612 Molecular biology of the gene (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

BIOL4417 'Omics' and systems biology (6)

CHEM4444 Chemical biology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Biochemistry

Offered to students 2015

admitted to Year 1 in

Objectives:

The Minor in Biochemistry is designed to provide students from all backgrounds with a multidisciplinary perspective on contemporary biochemistry and molecular biology. This minor curriculum incorporates significant flexibility to allow students to select courses that will complement the individual student's Major.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the fundamentals of biochemistry and molecular biology, and apply biochemical knowledge appropriately and effectively (by means of coursework and laboratory-based learning in the curriculum)
- integrate knowledge regarding the structure and function of biological molecules and how they come together to form the systems that make up life (by means of coursework and laboratory-based learning in the curriculum)
- PLO 3: develop a general interest in biochemistry and recognize the inter-relationship of biochemistry with other disciplines (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Biochemistry

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: Perspectives in biochemistry (6) BIOC1600 From molecules to cells (6) BIOL1110

BIOC2600 Basic biochemistry (6) Take either BIOC2600 or BIOL2220 to fulfill this 12 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive.

BIOL2220 Principles of biochemistry (6) Take either BIOC2600 or BIOL2220 to fulfill this 12 credits requirement, but not both. BIOC2600 and BIOL2220 are mutually

exclusive.

2. Advanced level courses (24 credits) **Disciplinary Electives (24 credits)**

At least 24 credits selected from the following courses: BIOC3601 Basic metabolism (6)

BIOC3604 Essential techniques in biochemistry and molecular biology (6)

BIOC3605 Sequence bioinformatics (6) Molecular medicine (6) **BIOC3606** BIOL3202 Nutritional biochemistry (6) BIOL3401 Molecular biology (6)

Cell biology and cell technology (6) **BIOL3402**

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6) BIOC4610 Advanced biochemistry (6) BIOC4612 Molecular biology of the gene (6)

Advanced techniques in biochemistry & molecular biology (6) **BIOC4613**

BIOL4417 'Omics' and systems biology (6)

CHEM4444 Chemical biology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Biochemistry

Offered to students 2014

admitted to Year 1 in

Objectives:

The Minor in Biochemistry is designed to provide students from all backgrounds with a multidisciplinary perspective on contemporary biochemistry and molecular biology. This minor curriculum incorporates significant flexibility to allow students to select courses that will complement the individual student's Major.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the fundamentals of biochemistry and molecular biology, and apply biochemical knowledge appropriately and effectively (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: integrate knowledge regarding the structure and function of biological molecules and how they come together to form the systems that make up life (by means of coursework and laboratory-based learning in the curriculum)
- PLO 3: develop a general interest in biochemistry and recognize the inter-relationship of biochemistry with other disciplines (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Biochemistry

BIOC3601

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:
BIOC1600 Perspectives in biochemistry (6)
BIOL1110 From molecules to cells (6)
BIOC2600 Basic biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOC3604 Essential techniques in biochemistry and molecular biology (6)
BIOC3605 Sequence bioinformatics (6)
BIOC3606 Molecular medicine (6)
BIOL3202 Nutritional biochemistry (6)
BIOL3401 Molecular biology (6)
BIOL3402 Cell biology and cell technology (6)
BIOL3403 Immunology (6)
BIOL3404 Protein structure and function (6)

Basic metabolism (6)

BIOL3404 Protein structure and function (6)
BIOC4610 Advanced biochemistry (6)
BIOC4612 Molecular biology of the gene (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

BIOL4417 'Omics' and systems biology (6)

CHEM4444 Chemical biology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

. Remarks:

Minor Title Minor in Biochemistry

Offered to students 2013

admitted to Year 1 in

Objectives:

The Minor in Biochemistry is designed to provide students from all backgrounds with a multidisciplinary perspective on contemporary biochemistry and molecular biology. This minor curriculum incorporates significant flexibility to allow students to select courses that will complement the individual student's Major.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the fundamentals of biochemistry and molecular biology, and apply biochemical knowledge appropriately and effectively (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: integrate knowledge regarding the structure and function of biological molecules and how they come together to form the systems that make up life (by means of coursework and laboratory-based learning in the curriculum)
- PLO 3: develop a general interest in biochemistry and recognize the inter-relationship of biochemistry with other disciplines (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Biochemistry

BIOC3601

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: Perspectives in biochemistry (6) BIOC1600 From molecules to cells (6) BIOL1110 BIOC2600 Basic biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses: Basic metabolism (6)

BIOC3604 Essential techniques in biochemistry and molecular biology (6) BIOC3605 Sequence bioinformatics (6) Molecular medicine (6) **BIOC3606** BIOL3202 Nutritional biochemistry (6) Molecular biology (6) BIOL3401

BIOL3402 Cell biology and cell technology (6) BIOL3403 Immunology (6) Protein structure and function (6) BIOL3404 BIOC4610 Advanced biochemistry (6) Molecular biology of the gene (6) BIOC4612

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

'Omics' and systems biology (6) **BIOL4417**

CHEM4444 Chemical biology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Biochemistry

Offered to students 2012

admitted to Year 1 in

Objectives:

The Minor in Biochemistry is designed to provide students from all backgrounds with a multidisciplinary perspective on contemporary biochemistry and molecular biology. This minor curriculum incorporates significant flexibility to allow students to select courses that will complement the individual student's Major.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe the fundamentals of biochemistry and molecular biology, and apply biochemical knowledge appropriately and effectively (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: integrate knowledge regarding the structure and function of biological molecules and how they come together to form the systems that make up life (by means of coursework and laboratory-based learning in the curriculum)
- PLO 3: develop a general interest in biochemistry and recognize the inter-relationship of biochemistry with other disciplines (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Biochemistry

BIOC3601

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:
BIOC1600 Perspectives in biochemistry (6)
BIOL1110 From molecules to cells (6)
BIOC2600 Basic biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOC3604 Essential techniques in biochemistry and molecular biology (6)
BIOC3605 Sequence bioinformatics (6)
BIOC3606 Molecular medicine (6)
BIOL3202 Nutritional biochemistry (6)
BIOL3401 Molecular biology (6)
BIOL3402 Cell biology and cell technology (6)

Basic metabolism (6)

BIOL3402 Cell biology and cell technology (6)
BIOL3403 Immunology (6)
BIOL3404 Protein structure and function (6)
BIOC4610 Advanced biochemistry (6)
BIOC4612 Molecular biology of the gene (6)

BIOC4613 Advanced techniques in biochemistry & molecular biology (6)

BIOL4417 'Omics' and systems biology (6)

CHEM4444 Chemical biology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Chemistry

Offered to students 2020

admitted to Year 1 in

Objectives:

The Minor in Chemistry aims to provide students with fundamental knowledge and skills of chemistry. The minor curriculum is flexible. Students of different majors in science and other disciplines will be able to select courses that complement their major areas of study as well as enhance their knowledge in chemistry.

Learning Outcomes:

By the end of this programme, students should be able to:

PLO 1: understand and apply the basic concepts of chemistry (by means of coursework and laboratory-based learning in the

curriculum)

PLO 2: apply chemistry concepts in other subjects (by means of coursework and laboratory-based learning in the curriculum)

PLO 3: transfer the basic concepts to complement their major area of study (by means of coursework and laboratory-based

learning in the curriculum)

Impermissible Combinations:

Major in Chemistry

Major in Chemistry (Intensive)

Required courses (42 credits)

1. Introductory level courses (24 credits)

Disciplinary Core Courses (12 credits)

CHEM1042 General chemistry I (6) CHEM1043 General chemistry II (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: Analytical chemistry I (6) CHEM2241 CHEM2341 Inorganic chemistry I (6)

CHEM2441 Organic chemistry I (6) CHEM2441 and CHEM2442 are mutually

exclusive

CHEM2442 Fundamentals of organic chemistry (6) CHEM2441 and CHEM2442 are mutually

exclusive.

CHEM2541 Introductory physical chemistry (6)

2. Advanced level courses (18 credits)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

List A

CHEM3141 Environmental chemistry (6)

CHEM3142 Chemical process industries and analysis (6) Introduction to materials chemistry (6) CHFM3143

Principles and applications of spectroscopic and CHEM3146

analytical techniques (6)

Analytical chemistry II: chemical instrumentation (6) CHEM3241

CHEM3242 Food and water analysis (6)

Introductory instrumental chemical analysis (6) CHEM3243 Analytical techniques for pharmacy students (6) CHEM3244

Inorganic chemistry II (6) CHEM3341 Bioinorganic chemistry (6) CHEM3342 Organic chemistry II (6) CHEM3441

Organic chemistry of biomolecules (6) CHEM3442 CHEM3443 Organic chemistry laboratory (6)

Integrated laboratory (6) CHEM3445

Physical chemistry: Introduction to quantum chemistry (6) CHEM3541 Physical chemistry: statistical thermodynamics and CHEM3542

kinetics theory (6)

Directed studies in chemistry (6) CHEM3999

Symmetry, group theory and applications (6) CHEM4142 CHEM4143 Interfacial science and technology (6)

CHEM4144 Advanced materials (6) CHEM4145 Medicinal chemistry (6) Supramolecular chemistry (6) CHEM4147

Frontiers in Modern Chemical Science (6) CHEM4148

CHEM4241 Modern chemical instrumentation and applications (6)

Analytical chemistry (6) CHFM4242

Advanced inorganic chemistry (6) CHEM4341 Organometallic chemistry (6) CHEM4342 Advanced organic chemistry (6) CHEM4441 CHEM4443 Integrated organic synthesis (6) CHEM4444 Chemical biology (6)

Computational chemistry (6) CHEM4542 Advanced physical chemistry (6) CHEM4543

Electrochemical science and technology (6) CHEM4544

CHEM4910 Chemistry literacy and research (6) CHEM4911 Capstone experience for chemistry undergraduates:

HKUtopia (6)

CHEM4966 Chemistry internship (6) CHEM4999 Chemistry project (12)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fuifill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks:

Minor Title Minor in Chemistry

Offered to students 2019

admitted to Year 1 in

Objectives:

The Minor in Chemistry aims to provide students with fundamental knowledge and skills of chemistry. The minor curriculum is flexible. Students of different majors in science and other disciplines will be able to select courses that complement their major areas of study as well as enhance their knowledge in chemistry.

Learning Outcomes:

By the end of this programme, students should be able to:

PLO 1: understand and apply the basic concepts of chemistry (by means of coursework and laboratory-based learning in the

curriculum)

PLO 2: apply chemistry concepts in other subjects (by means of coursework and laboratory-based learning in the curriculum)

PLO 3: transfer the basic concepts to complement their major area of study (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Chemistry

Major in Chemistry (Intensive)

Required courses (42 credits)

1. Introductory level courses (24 credits)

Disciplinary Core Courses (12 credits)

CHEM1042 General chemistry I (6) CHEM1043 General chemistry II (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:
CHEM2241 Analytical chemistry I (6)
CHEM2341 Inorganic chemistry I (6)
CHEM2441 Organic chemistry I (6)

CHEM2441 Organic chemistry I (6) CHEM2441 and CHEM2442 are mutually

exclusive.

CHEM2442 Fundamentals of organic chemistry (6) CHEM2441 and CHEM2442 are mutually exclusive.

CHEM2541 Introductory physical chemistry (6)

2. Advanced level courses (18 credits)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

List A

CHEM3141 Environmental chemistry (6)

CHEM3142 Chemical process industries and analysis (6)
CHEM3143 Introduction to materials chemistry (6)

CHEM3146 Principles and applications of spectroscopic and

analytical techniques (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3242 Food and water analysis (6)

CHEM3243 Introductory instrumental chemical analysis (6)
CHEM3244 Analytical techniques for pharmacy students (6)

CHEM3341 Inorganic chemistry II (6)
CHEM3342 Bioinorganic chemistry (6)
CHEM3441 Organic chemistry II (6)

CHEM3442 Organic chemistry of biomolecules (6) CHEM3443 Organic chemistry laboratory (6)

CHEM3445 Integrated laboratory (6)

CHEM3541 Physical chemistry: Introduction to quantum chemistry (6)
CHEM3542 Physical chemistry: statistical thermodynamics and

kinetics theory (6)

CHEM3999 Directed studies in chemistry (6)

CHEM4142 Symmetry, group theory and applications (6) CHEM4143 Interfacial science and technology (6)

CHEM4144 Advanced materials (6)
CHEM4145 Medicinal chemistry (6)
CHEM4147 Supramolecular chemistry (6)

CHEM4148 Frontiers in Modern Chemical Science (6)

CHEM4241 Modern chemical instrumentation and applications (6)

CHEM4242 Analytical chemistry (6)

CHEM4341 Advanced inorganic chemistry (6)
CHEM4342 Organometallic chemistry (6)
CHEM4441 Advanced organic chemistry (6)
CHEM4443 Integrated organic synthesis (6)
CHEM4444 Chemical biology (6)

CHEM4444 Chemical biology (6)
CHEM4542 Computational chemistry (6)
CHEM4543 Advanced physical chemistry (6)

CHEM4544 Electrochemical science and technology (6)
CHEM4910 Chemistry literacy and research (6)

CHEM4911 Capstone experience for chemistry undergraduates:

HKUtopia (6)

CHEM4966 Chemistry internship (6) CHEM4999 Chemistry project (12)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fuifill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks:

Minor Title Minor in Chemistry

Offered to students 2018

admitted to Year 1 in

Objectives:

The Minor in Chemistry aims to provide students with fundamental knowledge and skills of chemistry. The minor curriculum is flexible. Students of different majors in science and other disciplines will be able to select courses that complement their major areas of study as well as enhance their knowledge in chemistry.

Learning Outcomes:

By the end of this programme, students should be able to:

PLO 1: understand and apply the basic concepts of chemistry (by means of coursework and laboratory-based learning in the

curriculum)

PLO 2: apply chemistry concepts in other subjects (by means of coursework and laboratory-based learning in the curriculum)

PLO 3: transfer the basic concepts to complement their major area of study (by means of coursework and laboratory-based

learning in the curriculum)

Impermissible Combinations:

Major in Chemistry

Major in Chemistry (Intensive)

Required courses (42 credits)

1. Introductory level courses (24 credits)

Disciplinary Core Courses (12 credits)

CHEM1042 General chemistry I (6) CHEM1043 General chemistry II (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: Analytical chemistry I (6) CHEM2241 CHEM2341 Inorganic chemistry I (6)

CHEM2441 Organic chemistry I (6) CHEM2441 and CHEM2442 are mutually

exclusive

CHEM2442 Fundamentals of organic chemistry (6) CHEM2441 and CHEM2442 are mutually

exclusive.

2. Advanced level courses (18 credits)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

List A

CHEM2541

CHEM3141 Environmental chemistry (6)

CHEM3142 Chemical process industries and analysis (6) Introduction to materials chemistry (6) CHFM3143

Principles and applications of spectroscopic and CHEM3146

Introductory physical chemistry (6)

analytical techniques (6)

Analytical chemistry II: chemical instrumentation (6) CHEM3241

CHEM3242 Food and water analysis (6)

Introductory instrumental chemical analysis (6) CHEM3243 CHEM3244 Analytical techniques for pharmacy students (6)

Inorganic chemistry II (6) CHFM3341 Bioinorganic chemistry (6) CHEM3342 Organic chemistry II (6) CHEM3441

Organic chemistry of biomolecules (6) CHEM3442 CHEM3443 Organic chemistry laboratory (6)

Integrated laboratory (6) CHEM3445

Physical chemistry: Introduction to quantum chemistry (6) CHEM3541 Physical chemistry: statistical thermodynamics and CHEM3542

kinetics theory (6)

Directed studies in chemistry (6) CHEM3999

Symmetry, group theory and applications (6) CHEM4142 CHEM4143 Interfacial science and technology (6)

CHEM4144 Advanced materials (6) Medicinal chemistry (6) CHEM4145 Supramolecular chemistry (6) CHEM4147

Frontiers in Modern Chemical Science (6) CHEM4148

CHEM4241 Modern chemical instrumentation and applications (6)

Analytical chemistry (6) CHFM4242

Advanced inorganic chemistry (6) CHEM4341 Organometallic chemistry (6) CHEM4342 Advanced organic chemistry (6) CHEM4441 CHEM4443 Integrated organic synthesis (6) CHEM4444 Chemical biology (6)

Computational chemistry (6) CHEM4542 CHEM4543 Advanced physical chemistry (6)

Electrochemical science and technology (6) CHEM4544

CHEM4910 Chemistry literacy and research (6) CHEM4911 Capstone experience for chemistry undergraduates:

HKUtopia (6)

CHEM4966 Chemistry internship (6) CHEM4999 Chemistry project (12)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fuifill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks:

Minor Title Minor in Chemistry

Offered to students 2017

admitted to Year 1 in

Objectives:

The Minor in Chemistry aims to provide students with fundamental knowledge and skills of chemistry. The minor curriculum is flexible. Students of different majors in science and other disciplines will be able to select courses that complement their major areas of study as well as enhance their knowledge in chemistry.

Learning Outcomes:

By the end of this programme, students should be able to:

PLO 1: understand and apply the basic concepts of chemistry (by means of coursework and laboratory-based learning in the

curriculum)

PLO 2: apply chemistry concepts in other subjects (by means of coursework and laboratory-based learning in the curriculum)

PLO 3: transfer the basic concepts to complement their major area of study (by means of coursework and laboratory-based

learning in the curriculum)

Impermissible Combinations:

Major in Chemistry

Major in Chemistry (Intensive)

Required courses (42 credits)

1. Introductory level courses (24 credits)

Disciplinary Core Courses (12 credits)

CHEM1042 General chemistry I (6) CHEM1043 General chemistry II (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: Analytical chemistry I (6) CHEM2241 CHEM2341 Inorganic chemistry I (6)

CHEM2441 Organic chemistry I (6) CHEM2441 and CHEM2442 are mutually

exclusive

CHEM2442 Fundamentals of organic chemistry (6) CHEM2441 and CHEM2442 are mutually

exclusive.

CHEM2541 Introductory physical chemistry (6)

2. Advanced level courses (18 credits)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

List A

CHEM3141 Environmental chemistry (6)

CHEM3142 Chemical process industries and analysis (6) Introduction to materials chemistry (6) CHFM3143

Principles and applications of spectroscopic and CHEM3146

analytical techniques (6)

Analytical chemistry II: chemical instrumentation (6) CHEM3241

CHEM3242 Food and water analysis (6)

Introductory instrumental chemical analysis (6) CHEM3243 CHEM3244 Analytical techniques for pharmacy students (6)

Inorganic chemistry II (6) CHEM3341 Bioinorganic chemistry (6) CHEM3342 Organic chemistry II (6) CHEM3441

Organic chemistry of biomolecules (6) CHEM3442 CHEM3443 Organic chemistry laboratory (6)

Integrated laboratory (6) CHEM3445

Physical chemistry: Introduction to quantum chemistry (6) CHEM3541 Physical chemistry: statistical thermodynamics and CHEM3542

kinetics theory (6)

Directed studies in chemistry (6) CHEM3999

Symmetry, group theory and applications (6) CHEM4142 CHEM4143 Interfacial science and technology (6)

CHEM4144 Advanced materials (6) Medicinal chemistry (6) CHEM4145 Supramolecular chemistry (6) CHEM4147

Frontiers in Modern Chemical Science (6) CHEM4148

CHEM4241 Modern chemical instrumentation and applications (6)

Analytical chemistry (6) CHFM4242

Advanced inorganic chemistry (6) CHEM4341 Organometallic chemistry (6) CHEM4342 Advanced organic chemistry (6) CHEM4441 CHEM4443 Integrated organic synthesis (6) CHEM4444 Chemical biology (6)

Computational chemistry (6) CHEM4542 Advanced physical chemistry (6) CHEM4543

Electrochemical science and technology (6) CHEM4544

CHEM4910 Chemistry literacy and research (6) CHEM4911 Capstone experience for chemistry undergraduates:

HKUtopia (6)

CHEM4966 Chemistry internship (6) CHEM4999 Chemistry project (12)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fuifill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks:

Minor Title Minor in Chemistry

Offered to students 2016

admitted to Year 1 in

Objectives:

The Minor in Chemistry aims to provide students with fundamental knowledge and skills of chemistry. The minor curriculum is flexible. Students of different majors in science and other disciplines will be able to select courses that complement their major areas of study as well as enhance their knowledge in chemistry.

Learning Outcomes:

By the end of this programme, students should be able to:

PLO 1: understand and apply the basic concepts of chemistry (by means of coursework and laboratory-based learning in the curriculum)

PLO 2: apply chemistry concepts in other subjects (by means of coursework and laboratory-based learning in the curriculum)

PLO 3: transfer the basic concepts to complement their major area of study (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Chemistry

Major in Chemistry (Intensive)

Required courses (42 credits)

1. Introductory level courses (24 credits)

Disciplinary Core Courses (12 credits)

CHEM1042 General chemistry I (6) CHEM1043 General chemistry II (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: Principles of chemistry (6) CHEM2041 CHEM2241 Analytical chemistry I (6) CHEM2341 Inorganic chemistry I (6) Organic chemistry I (6) CHEM2441

CHEM2441 and CHEM2442 are mutually

exclusive

CHEM2441 and CHEM2442 are mutually CHEM2442 Fundamentals of organic chemistry (6)

exclusive.

2. Advanced level courses (18 credits)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

List A

CHEM2541

CHEM3141 Environmental chemistry (6) Chemical process industries and analysis (6) CHEM3142

CHEM3143 Introduction to materials chemistry (6)

CHEM3146 Principles and applications of spectroscopic and analytical techniques (6)

Introductory physical chemistry (6)

Analytical chemistry II: chemical instrumentation (6) CHEM3241

Food and water analysis (6) CHEM3242

Introductory instrumental chemical analysis (6) CHEM3243 Analytical techniques for pharmacy students (6) CHFM3244

Inorganic chemistry II (6) CHEM3341 Bioinorganic chemistry (6) CHEM3342 Organic chemistry II (6) CHEM3441

CHEM3442 Organic chemistry of biomolecules (6) Organic chemistry laboratory (6) CHEM3443

Integrated laboratory (6) CHEM3445

Physical chemistry: Introduction to quantum chemistry (6) CHEM3541 Physical chemistry: statistical thermodynamics and CHEM3542

kinetics theory (6)

Directed studies in chemistry (6) CHEM3999

CHEM4142 Symmetry, group theory and applications (6) CHEM4143 Interfacial science and technology (6)

Advanced materials (6) CHEM4144 Medicinal chemistry (6) CHEM4145 Supramolecular chemistry (6) CHEM4147

CHEM4148 Frontiers in Modern Chemical Science (6)

Modern chemical instrumentation and applications (6) CHFM4241

Analytical chemistry (6) CHEM4242

Advanced inorganic chemistry (6) CHEM4341 Organometallic chemistry (6) CHEM4342 CHEM4441 Advanced organic chemistry (6) CHEM4443 Integrated organic synthesis (6) Chemical biology (6) CHEM4444

Computational chemistry (6) CHEM4542 Advanced physical chemistry (6) CHEM4543

CHEM4544 Electrochemical science and technology (6) CHEM4910 Chemistry literacy and research (6)

CHEM4911 Capstone experience for chemistry undergraduates:

HKUtopia (6)

CHEM4966 Chemistry internship (6) CHEM4999 Chemistry project (12)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fuifill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks:

Minor Title Minor in Chemistry

Offered to students 2015

admitted to Year 1 in

Objectives:

The Minor in Chemistry aims to provide students with fundamental knowledge and skills of chemistry. The minor curriculum is flexible. Students of different majors in science and other disciplines will be able to select courses that complement their major areas of study as well as enhance their knowledge in chemistry.

Learning Outcomes:

By the end of this programme, students should be able to:

PLO 1: understand and apply the basic concepts of chemistry (by means of coursework and laboratory-based learning in the

curriculum)

PLO 2: apply chemistry concepts in other subjects (by means of coursework and laboratory-based learning in the curriculum)

PLO 3: transfer the basic concepts to complement their major area of study (by means of coursework and laboratory-based

learning in the curriculum)

Impermissible Combinations:

Major in Chemistry

Major in Chemistry (Intensive)

Required courses (42 credits)

1. Introductory level courses (24 credits)

Disciplinary Core Courses (12 credits)

CHEM1042 General chemistry I (6) CHEM1043 General chemistry II (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: Principles of chemistry (6) CHEM2041 CHEM2241 Analytical chemistry I (6) CHEM2341 Inorganic chemistry I (6) Organic chemistry I (6)

CHEM2441 and CHEM2442 are mutually CHEM2441

exclusive

CHEM2441 and CHEM2442 are mutually CHEM2442 Fundamentals of organic chemistry (6) exclusive.

CHEM2541 Introductory physical chemistry (6)

2. Advanced level courses (18 credits)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

List A

CHEM3141 Environmental chemistry (6) CHEM3142

Chemical process industries and analysis (6) CHEM3143 Introduction to materials chemistry (6)

CHEM3146 Principles and applications of spectroscopic and

analytical techniques (6)

Analytical chemistry II: chemical instrumentation (6) CHEM3241

Food and water analysis (6) CHEM3242

Introductory instrumental chemical analysis (6) CHEM3243 Analytical techniques for pharmacy students (6) CHFM3244

Inorganic chemistry II (6) CHEM3341 Bioinorganic chemistry (6) CHEM3342 Organic chemistry II (6) CHEM3441

CHEM3442 Organic chemistry of biomolecules (6) Organic chemistry laboratory (6) CHEM3443

Integrated laboratory (6) CHEM3445

Physical chemistry: Introduction to quantum chemistry (6) CHEM3541 Physical chemistry: statistical thermodynamics and CHEM3542

kinetics theory (6)

Directed studies in chemistry (6) CHEM3999

CHEM4142 Symmetry, group theory and applications (6) CHEM4143 Interfacial science and technology (6)

Advanced materials (6) CHEM4144 Medicinal chemistry (6) CHEM4145 Supramolecular chemistry (6) CHEM4147

CHEM4148 Frontiers in Modern Chemical Science (6)

Modern chemical instrumentation and applications (6) CHFM4241

Analytical chemistry (6) CHEM4242

Advanced inorganic chemistry (6) CHEM4341 Organometallic chemistry (6) CHEM4342 CHEM4441 Advanced organic chemistry (6) CHEM4443 Integrated organic synthesis (6) Chemical biology (6) CHEM4444

Computational chemistry (6) CHEM4542 Advanced physical chemistry (6) CHEM4543

CHEM4544 Electrochemical science and technology (6) CHEM4910 Chemistry literacy and research (6)

CHEM4911 Capstone experience for chemistry undergraduates:

HKUtopia (6)

CHEM4966 Chemistry internship (6) CHEM4999 Chemistry project (12)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fuifill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks:

Minor Title Minor in Chemistry

Offered to students

2014

admitted to Year 1 in

Objectives:

The Minor in Chemistry aims to provide students with fundamental knowledge and skills of chemistry. The minor curriculum is flexible. Students of different majors in science and other disciplines will be able to select courses that complement their major areas of study as well as enhance their knowledge in chemistry.

Learning Outcomes:

By the end of this programme, students should be able to:

PLO 1: understand and apply the basic concepts of chemistry (by means of coursework and laboratory-based learning in the curriculum)

PLO 2: apply chemistry concepts in other subjects (by means of coursework and laboratory-based learning in the curriculum)

PLO 3: transfer the basic concepts to complement their major area of study (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Chemistry

Major in Chemistry (Intensive)

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (6 credits)

CHEM1042 General chemistry I (6) [previous title: General chemistry (6)]

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

CHEM2041 Principles of chemistry (6) Analytical chemistry I (6) CHEM2241 CHEM2341 Inorganic chemistry I (6)

CHEM2441 Organic chemistry I (6) CHEM2441 and CHEM2442 are mutually exclusive. Fundamentals of organic chemistry (6) CHEM2441 and CHEM2442 are mutually exclusive. CHEM2442 Introductory physical chemistry (6) [previous title: Physical chemistry I (6)] CHEM2541

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

List A CHEM3141 Environmental chemistry (6)

Chemical process industries and analysis (6) CHEM3142 CHEM3143 Introduction to materials chemistry (6) Principles and applications of spectroscopic and CHEM3146

analytical techniques (6)

Analytical chemistry II: chemical instrumentation CHEM3241

Food and water analysis (6) CHEM3242

CHEM3243 Introductory instrumental chemical analysis (6) Analytical techniques for pharmacy students (6) CHFM3244

Inorganic chemistry II (6) CHEM3341 Bioinorganic chemistry (6) CHEM3342 Organic chemistry II (6) CHEM3441

CHEM3442 Organic chemistry of biomolecules (6) Organic chemistry laboratory (6) CHFM3443

Integrated laboratory (6) CHEM3445 Physical chemistry: Introduction to quantum

CHEM3541 chémistry (6)

Physical chemistry: statistical thermodynamics CHEM3542 and kinetics theory (6)

Directed studies in chemistry (6) CHEM3999

Symmetry, group theory and applications (6) CHEM4142 CHEM4143 Interfacial science and technology (6)

CHEM4144 Advanced materials (6) CHEM4145 Medicinal chemistry (6) Supramolecular chemistry (6) CHEM4147

Frontiers in Modern Chemical Science (6) **CHEM4148** CHEM4241 Modern chemical instrumentation and

applications (6) CHEM4242 Analytical chemistry (6)

Advanced inorganic chemistry (6) CHEM4341 Organometallic chemistry (6) CHEM4342 Advanced organic chemistry (6) CHEM4441 CHEM4443 Integrated organic synthesis (6)

CHEM4444 Chemical biology (6) CHEM4542 Computational chemistry (6) Advanced physical chemistry (6) CHEM4543

CHEM4544 Electrochemical science and technology (6) [previous title: Physical chemistry II: Introduction to quantum chemistry (6)]

CHEM4910 Chemistry literacy and research (6)
CHEM4911 Capstone experience for chemistry undergraduates: HKUtopia (6)
CHEM4966 Chemistry internship (6)
CHEM4999 Chemistry project (12)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fuifill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks:

Minor Title Minor in Chemistry

Offered to students 2013

admitted to Year 1 in

Objectives:

The Minor in Chemistry aims to provide students with fundamental knowledge and skills of chemistry. The minor curriculum is flexible. Students of different majors in science and other disciplines will be able to select courses that complement their major areas of study as well as enhance their knowledge in chemistry.

Learning Outcomes:

By the end of this programme, students should be able to:

PLO 1: understand and apply the basic concepts of chemistry (by means of coursework and laboratory-based learning in the curriculum)

PLO 2: apply chemistry concepts in other subjects (by means of coursework and laboratory-based learning in the curriculum)

PLO 3: transfer the basic concepts to complement their major area of study (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Chemistry

Major in Chemistry (Intensive)

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (6 credits)

CHEM1042 General chemistry I (6)

[previous title: General chemistry (6)]

[previous title: Physical chemistry II: Introduction to

quantum chemistry (6)]

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

CHEM2041 Principles of chemistry (6) Analytical chemistry I (6) CHEM2241 CHEM2341 Inorganic chemistry I (6)

CHEM2441 Organic chemistry I (6) CHEM2441 and CHEM2442 are mutually exclusive. Fundamentals of organic chemistry (6) CHEM2441 and CHEM2442 are mutually exclusive. CHEM2442 Introductory physical chemistry (6) [previous title: Physical chemistry I (6)] CHEM2541

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

List A CHEM3141 Environmental chemistry (6)

Chemical process industries and analysis (6) CHEM3142 CHEM3143 Introduction to materials chemistry (6) Principles and applications of spectroscopic and CHEM3146

analytical techniques (6)

CHEM3241 Analytical chemistry II: chemical instrumentation

Food and water analysis (6) CHEM3242

CHEM3243 Introductory instrumental chemical analysis (6) Analytical techniques for pharmacy students (6) CHFM3244

Inorganic chemistry II (6) CHEM3341 Bioinorganic chemistry (6) CHEM3342 Organic chemistry II (6) CHEM3441

CHEM3442 Organic chemistry of biomolecules (6) Organic chemistry laboratory (6) CHFM3443

Integrated laboratory (6) CHEM3445 Physical chemistry: Introduction to quantum

CHEM3541 chémistry (6)

Physical chemistry: statistical thermodynamics CHEM3542 and kinetics theory (6)

Directed studies in chemistry (6) CHEM3999

Symmetry, group theory and applications (6) CHEM4142 CHEM4143 Interfacial science and technology (6)

CHEM4144 Advanced materials (6) Medicinal chemistry (6) CHEM4145 Supramolecular chemistry (6) CHEM4147

Frontiers in Modern Chemical Science (6) **CHEM4148** CHEM4241 Modern chemical instrumentation and applications (6)

CHEM4242 Analytical chemistry (6)

Advanced inorganic chemistry (6) CHEM4341 Organometallic chemistry (6) CHEM4342 Advanced organic chemistry (6) CHEM4441 Integrated organic synthesis (6) CHEM4443

CHEM4444 Chemical biology (6)

Physical chemistry III: statistical thermodynamics CHEM4541

and kinetics theory (6) CHEM4542 Computational chemistry (6)

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CHEM4543 CHEM4544	Advanced physical chemistry (6) Electrochemical science and technology (6)
CHEM4910 CHEM4911	Chemistry literacy and research (6) Capstone experience for chemistry undergraduates: HKUtopia (6)
CHEM4966 CHEM4999	Chemistry internship (6) Chemistry project (12)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks:

Minor Title Minor in Chemistry

Offered to students

admitted to Year 1 in

Objectives:

The Minor in Chemistry aims to provide students with fundamental knowledge and skills of chemistry. The minor curriculum is flexible. Students of different majors in science and other disciplines will be able to select courses that complement their major areas of study as well as enhance their knowledge in chemistry.

Learning Outcomes:

By the end of this programme, students should be able to:

2012

PLO 1: understand and apply the basic concepts of chemistry (by means of coursework and laboratory-based learning in the curriculum)

PLO 2: apply chemistry concepts in other subjects (by means of coursework and laboratory-based learning in the curriculum)

PLO 3: transfer the basic concepts to complement their major area of study (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Chemistry

Major in Chemistry (Intensive)

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (6 credits)

CHEM1042 General chemistry I (6) [previous title: General chemistry (6)]

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

CHEM2041 Principles of chemistry (6) Analytical chemistry I (6) CHEM2241 CHEM2341 Inorganic chemistry I (6) CHEM2441

Organic chemistry I (6) CHEM2441 and CHEM2442 are mutually exclusive. Fundamentals of organic chemistry (6) CHEM2441 and CHEM2442 are mutually exclusive. CHEM2442 Introductory physical chemistry (6) [previous title: Physical chemistry I (6)] CHEM2541

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits of advanced level Chemistry courses (CHEM3XXX or CHEM4XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

[previous title: Physical chemistry II: Introduction to

quantum chemistry (6)]

List A CHEM3141 Environmental chemistry (6)

Chemical process industries and analysis (6) CHEM3142 CHEM3143 Introduction to materials chemistry (6) Principles and applications of spectroscopic and CHEM3146

analytical techniques (6)

CHEM3241 Analytical chemistry II: chemical instrumentation

Food and water analysis (6) CHEM3242

CHEM3243 Introductory instrumental chemical analysis (6) Analytical techniques for pharmacy students (6) CHFM3244

Inorganic chemistry II (6) CHEM3341 Bioinorganic chemistry (6) CHEM3342 Organic chemistry II (6) CHEM3441

CHEM3442 Organic chemistry of biomolecules (6) Organic chemistry laboratory (6) CHFM3443

Integrated laboratory (6) CHEM3445 Physical chemistry: Introduction to quantum

CHEM3541 chémistry (6)

Physical chemistry: statistical thermodynamics CHEM3542 and kinetics theory (6)

Directed studies in chemistry (6) CHEM3999

Symmetry, group theory and applications (6) CHEM4142 CHEM4143 Interfacial science and technology (6)

CHEM4144 Advanced materials (6) Medicinal chemistry (6) CHEM4145 Supramolecular chemistry (6) CHEM4147

Frontiers in Modern Chemical Science (6) **CHEM4148** CHEM4241 Modern chemical instrumentation and applications (6)

CHEM4242 Analytical chemistry (6)

Advanced inorganic chemistry (6) CHEM4341 Organometallic chemistry (6) CHEM4342 Advanced organic chemistry (6) CHEM4441 Integrated organic synthesis (6) CHEM4443

CHEM4444 Chemical biology (6)

Physical chemistry III: statistical thermodynamics CHEM4541

and kinetics theory (6) CHEM4542 Computational chemistry (6)

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CHEM4543 CHEM4544 CHEM4910	Advanced physical chemistry (6) Electrochemical science and technology (6) Chemistry literacy and research (6)
CHEM4911	Capstone experience for chemistry undergraduates: HKUtopia (6)
CHEM4966 CHEM4999	Chemistry internship (6) Chemistry project (12)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Chemistry or equivalent to take this major. Students who do not fulfill this requirement are advised to take CHEM1041 Foundations of chemistry.

Remarks:

Offered to students 2020

admitted to Year 1 in

Objectives:

The Minor in Computational & Financial Mathematics provides students with fundamental knowledge in both computational mathematics and financial mathematics. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from computational sciences and financial industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe fundamental concepts in computational and financial mathematics (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Course (6 credits)

MATH1013 University mathematics II (6)

Disciplinary Electives (12 credits)

Select either List A or List B:

List A

MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)

IVIA I I List B

MATH2012 Fundamental concepts of mathematics (6)
MATH2014 Multivariable calculus and linear algebra (6)

2. Advanced level courses (24 credits) Disciplinary Core Courses (12 credits)

MATH3601 Numerical analysis (6) MATH3906 Financial calculus (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3408 Computational methods and differential equations with

applications (6)
MATH3603 Probability theory (6)

MATH3904 Introduction to optimization (6)
MATH3911 Game theory and strategy (6)
MATH4602 Scientific computing (6)

MATH4907 Numerical methods for financial calculus (6)
MATH7217 Topics in financial mathematics (6)
MATH7224 Topics in advanced probability theory (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Offered to students 2019

admitted to Year 1 in

Objectives:

The Minor in Computational & Financial Mathematics provides students with fundamental knowledge in both computational mathematics and financial mathematics. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from computational sciences and financial industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe fundamental concepts in computational and financial mathematics (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and projectbased learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Course (6 credits)

University mathematics II (6) MATH1013

Disciplinary Electives (12 credits)

Select either List A or List B:

I ist A

MATH2101 Linear algebra I (6) Multivariable calculus (6) MATH2211

List B MATH2012 Fundamental concepts of mathematics (6)

MATH2014 Multivariable calculus and linear algebra (6)

2. Advanced level courses (24 credits) **Disciplinary Core Courses (12 credits)**

Numerical analysis (6) MATH3601 **MATH3906** Financial calculus (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3408 Computational methods and differential equations with

applications (6) Probability theory (6) MATH3603

Introduction to optimization (6) MATH3904 MATH3911 Game theory and strategy (6) Scientific computing (6) MATH4602

Numerical methods for financial calculus (6) MATH4907 MATH7217 Topics in financial mathematics (6) MATH7224 Topics in advanced probability theory (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Offered to students 2018

admitted to Year 1 in

Objectives:

The Minor in Computational & Financial Mathematics provides students with fundamental knowledge in both computational mathematics and financial mathematics. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from computational sciences and financial industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe fundamental concepts in computational and financial mathematics (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and projectbased learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Course (6 credits)

University mathematics II (6) MATH1013

Disciplinary Electives (12 credits)

Select either List A or List B:

I ist A

MATH2101 Linear algebra I (6) Multivariable calculus (6) MATH2211

List B MATH2012 Fundamental concepts of mathematics (6) MATH2014 Multivariable calculus and linear algebra (6)

2. Advanced level courses (24 credits) **Disciplinary Core Courses (12 credits)**

Numerical analysis (6) MATH3601 **MATH3906** Financial calculus (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

Computational methods and differential equations with MATH3408

applications (6) Probability theory (6) MATH3603

Introduction to optimization (6) MATH3904 MATH3911 Game theory and strategy (6) Scientific computing (6) MATH4602

Numerical methods for financial calculus (6) MATH4907 MATH7217 Topics in financial mathematics (6) Topics in advanced probability theory (6) **MATH7224**

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Offered to students 2017

admitted to Year 1 in

Objectives:

The Minor in Computational & Financial Mathematics provides students with fundamental knowledge in both computational mathematics and financial mathematics. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from computational sciences and financial industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe fundamental concepts in computational and financial mathematics (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Major in Mathematics/Physics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Course (6 credits)

MATH1013 University mathematics II (6)

Disciplinary Electives (12 credits)

Select either List A or List B:

List A

MATH2101 Linear algebra I (6) MATH2211 Multivariable calculus (6)

List B

MATH2012 Fundamental concepts of mathematics (6)
MATH2014 Multivariable calculus and linear algebra (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

MATH3601 Numerical analysis (6) MATH3906 Financial calculus (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3408 Computational methods and differential equations with

applications (6)

MATH3603 Probability theory (6)
MATH3904 Introduction to optimization (6)
MATH3911 Game theory and strategy (6)

MATH4602 Scientific computing (6)
MATH4907 Numerical methods for financial calculus (6)
MATH7217 Topics in financial mathematics (6)
MATH7224 Topics in advanced probability theory (6)

Notes

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

2016

Offered to students

admitted to Year 1 in

Objectives:

The Minor in Computational & Financial Mathematics provides students with fundamental knowledge in both computational mathematics and financial mathematics. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from computational sciences and financial industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe fundamental concepts in computational and financial mathematics (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Major in Mathematics/Physics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Course (6 credits)

MATH1013 University mathematics II (6)

Disciplinary Electives (12 credits)

Select either List A or List B:

List A

MATH2101 Linear algebra I (6) MATH2211 Multivariable calculus (6)

List B

MATH2012 Fundamental concepts of mathematics (6)
MATH2014 Multivariable calculus and linear algebra (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

MATH3601 Numerical analysis (6) MATH3906 Financial calculus (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3408 Computational methods and differential equations with

applications (6)

MATH3603 Probability theory (6)

MATH3904 Introduction to optimization (6)
MATH3911 Game theory and strategy (6)
MATH4602 Scientific computing (6)

MATH4907 Numerical methods for financial calculus (6)
MATH7217 Topics in financial mathematics (6)
MATH7224 Topics in advanced probability theory (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Offered to students 2015

admitted to Year 1 in

Objectives:

The Minor in Computational & Financial Mathematics provides students with fundamental knowledge in both computational mathematics and financial mathematics. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from computational sciences and financial industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe fundamental concepts in computational and financial mathematics (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Course (6 credits)

MATH1013 University mathematics II (6)

Disciplinary Electives (12 credits)

Select either List A or List B:

List A

MATH2101 Linear algebra I (6)

MATH2211 Multivariable calculus (6)

List B

MATH2012 Fundamental concepts of mathematics (6)
MATH2014 Multivariable calculus and linear algebra (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

MATH3601 Numerical analysis (6) MATH3906 Financial calculus (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3408 Computational methods and differential equations with

applications (6)

MATH3603 Probability theory (6)

MATH3904 Introduction to optimization (6)
MATH3911 Game theory and strategy (6)
MATH4602 Scientific computing (6)

MATH4907 Numerical methods for financial calculus (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Offered to students 2014

admitted to Year 1 in

Objectives:

The Minor in Computational & Financial Mathematics provides students with fundamental knowledge in both computational mathematics and financial mathematics. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from computational sciences and financial industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe fundamental concepts in computational and financial mathematics (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Courses (18 credits)

MATH1013 University mathematics II (6)
MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

MATH3601 Numerical analysis (6) MATH3906 Financial calculus (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3408 Computational methods and differential equations with

applications (6)
MATH3603 Probability theory (6)
MATH3904 Introduction to optimization (6)
MATH3911 Game theory and strategy (6)
MATH4602 Scientific computing (6)

MATH4907 Numerical methods for financial calculus (6)

Notes

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Offered to students 2013

admitted to Year 1 in

Objectives:

The Minor in Computational & Financial Mathematics provides students with fundamental knowledge in both computational mathematics and financial mathematics. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from computational sciences and financial industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe fundamental concepts in computational and financial mathematics (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Minor in Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Courses (18 credits)

MATH1013 University mathematics II (6)
MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

MATH3601 Numerical analysis (6) MATH3906 Financial calculus (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3408 Computational methods and differential equations with

applications (6)
MATH3603 Probability theory (6)
MATH3904 Introduction to optimization (6)
MATH3911 Game theory and strategy (6)
MATH4602 Scientific computing (6)

MATH4907 Numerical methods for financial calculus (6)

Notes

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Offered to students 2012

admitted to Year 1 in

Objectives:

The Minor in Computational & Financial Mathematics provides students with fundamental knowledge in both computational mathematics and financial mathematics. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from computational sciences and financial industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe fundamental concepts in computational and financial mathematics (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and projectbased learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Minor in Mathematics

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Courses (18 credits)

University mathematics II (6) MATH1013 MATH2101 Linear algebra I (6) MATH2211 Multivariable calculus (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

MATH3601 Numerical analysis (6) MATH3906 Financial calculus (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3408 Computational methods and differential equations with

applications (6) MATH3603 Probability theory (6) Introduction to optimization (6) MATH3904

MATH3911 Game theory and strategy (6) Scientific computing (6) MATH4602

Numerical methods for financial calculus (6) MATH4907

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Offered to students 2020

admitted to Year 1 in

Objectives:

The Minor in Earth Sciences aims to provide interested students with an introduction to the fundamental structure, process and history of the Earth. The minor curriculum is designed particularly to provide students from different majors the flexibility to select courses to enhance their interests in Earth Sciences or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe the methods used by the Earth scientists to study the Earth systems (by means to coursework, tutorial classes and field-based learning in the curriculum)
- PLO 2: understand and describe the basic nomenclature used in Earth Sciences (by means to coursework, tutorial classes and field-based learning in the curriculum)
- PLO 3: discuss and comment critically issues related to the Earth Sciences in media reports (by means to coursework, tutorial classes and field-based learning in the curriculum)

Impermissible Combinations:

Major in Earth System Science

Major in Geology

Major in Geology (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: EASC1401 Blue Planet (6) EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits of advanced level Earth Sciences courses (EASC3XXX or EASC4XXX level), subject to prerequisite requirements. The current course list includes courses in List A

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EASC3020	Global change: anthropogenic impacts (6)
EASC3402	Petrology (6)
EASC3403	Sedimentary environments (6)
EASC3404	Structural geology (6)
EASC3405	Environmental remote sensing (6)
EASC3406	Reconstruction of past climate (6)
EASC3408	Geophysics (6)
EASC3409	Igneous and metamorphic petrogenesis (6)
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EASC3412	Earth resources (6)
EASC3413	Engineering geology (6)
EASC3414	Soil and rock mechanics (6)

EASC3415 Meteorology (6) Advanced geochemistry and geochronology (6) EASC3416

Earth through time (6) EASC3417

Directed studies in earth sciences (6) **EASC3999**

Biogeochemical cycles (6) EASC4403

EASC4406 Earth dynamics & global tectonics (6)

EASC4407 Regional geology (6)

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EASC4955 Integrated field studies (6) **EASC4966** Earth sciences internship (6) Earth sciences project (12) **EASC4999**

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2019

admitted to Year 1 in

Objectives:

The Minor in Earth Sciences aims to provide interested students with an introduction to the fundamental structure, process and history of the Earth. The minor curriculum is designed particularly to provide students from different majors the flexibility to select courses to enhance their interests in Earth Sciences or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe the methods used by the Earth scientists to study the Earth systems (by means to coursework, tutorial classes and field-based learning in the curriculum)
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Impermissible Combinations:

Major in Earth System Science

Major in Geology

Major in Geology (Intensive)

Required courses (36 credits)

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Offered to students 2018

admitted to Year 1 in

Objectives:

The Minor in Earth Sciences aims to provide interested students with an introduction to the fundamental structure, process and history of the Earth. The minor curriculum is designed particularly to provide students from different majors the flexibility to select courses to enhance their interests in Earth Sciences or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe the methods used by the Earth scientists to study the Earth systems (by means to coursework, tutorial classes and field-based learning in the curriculum)
- PLO 2: understand and describe the basic nomenclature used in Earth Sciences (by means to coursework, tutorial classes and field-based learning in the curriculum)
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Impermissible Combinations:

Major in Earth System Science

Major in Geology

Major in Geology (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

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Offered to students 2017

admitted to Year 1 in

Objectives:

The Minor in Earth Sciences aims to provide interested students with an introduction to the fundamental structure, process and history of the Earth. The minor curriculum is designed particularly to provide students from different majors the flexibility to select courses to enhance their interests in Earth Sciences or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe the methods used by the Earth scientists to study the Earth systems (by means to coursework, tutorial classes and field-based learning in the curriculum)
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Impermissible Combinations:

Major in Earth System Science

Major in Geology

Major in Geology (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses: EASC1401 Blue Planet (6) EASC1402 Principles of geology (6)

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2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

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Offered to students 2016

admitted to Year 1 in

Objectives:

The Minor in Earth Sciences aims to provide interested students with an introduction to the fundamental structure, process and history of the Earth. The minor curriculum is designed particularly to provide students from different majors the flexibility to select courses to enhance their interests in Earth Sciences or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe the methods used by the Earth scientists to study the Earth systems (by means to coursework, tutorial classes and field-based learning in the curriculum)
- PLO 2: understand and describe the basic nomenclature used in Earth Sciences (by means to coursework, tutorial classes and field-based learning in the curriculum)
- PLO 3: discuss and comment critically issues related to the Earth Sciences in media reports (by means to coursework, tutorial classes and field-based learning in the curriculum)

Impermissible Combinations:

Major in Earth System Science

Major in Geology

Major in Geology (Intensive)

Required courses (36 credits)

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Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

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Remarks

Offered to students 2015

admitted to Year 1 in

Objectives:

The Minor in Earth Sciences aims to provide interested students with an introduction to the fundamental structure, process and history of the Earth. The minor curriculum is designed particularly to provide students from different majors the flexibility to select courses to enhance their interests in Earth Sciences or to complement their major of study.

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By the end of this programme, students should be able to:

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Major in Earth System Science

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Offered to students 2014

admitted to Year 1 in

Objectives:

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Offered to students 2013

admitted to Year 1 in

Objectives:

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- PLO 2: understand and describe the basic nomenclature used in Earth Sciences (by means to coursework, tutorial classes and field-based learning in the curriculum)
- PLO 3: discuss and comment critically issues related to the Earth Sciences in media reports (by means to coursework, tutorial classes and field-based learning in the curriculum)

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Offered to students 2012

admitted to Year 1 in

Objectives:

The Minor in Earth Sciences aims to provide interested students with an introduction to the fundamental structure, process and history of the Earth. The minor curriculum is designed particularly to provide students from different majors the flexibility to select courses to enhance their interests in Earth Sciences or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe the methods used by the Earth scientists to study the Earth systems (by means to coursework, tutorial classes and field-based learning in the curriculum)
- PLO 2: understand and describe the basic nomenclature used in Earth Sciences (by means to coursework, tutorial classes and field-based learning in the curriculum)
- PLO 3: discuss and comment critically issues related to the Earth Sciences in media reports (by means to coursework, tutorial classes and field-based learning in the curriculum)

Impermissible Combinations:

Major in Earth System Science

Major in Geology

Major in Geology (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

EASC1401 Blue Planet (6)

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2. Advanced level courses (24 credits)

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EASC3417 Earth through time (6)

EASC3999 Directed studies in earth sciences (6)
EASC4403 Biogeochemical cycles (6)

EASC4406 Earth dynamics & global tectonics (6)

EASC4407 Regional geology (6)

EASC4408 Special topics in earth sciences (6)
EASC4911 Earth system: contemporary issues (6)

EASC4955 Integrated field studies (6)
EASC4966 Earth sciences internship (6)
EASC4999 Earth sciences project (12)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks

Offered to students 2020

admitted to Year 1 in

Objectives:

This Minor in Ecology & Biodiversity is an ideal introduction to the natural world, the species and ecosystems it comprises and the biological rules it follows. It aims to allow students to learn about general ecological principles and the local flora and fauna of the region, and the conservation challenges that will need to be addressed in a rapidly-changing world. Students will be able to build upon this basic knowledge developed at the introductory level by selecting from among a wide range of courses that offer learning opportunities through practical and field work, as well as traditional and virtual teaching, in more specialized areas of ecology and biodiversity.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate and describe the importance of ecology and biodiversity, and the importance of the variety of life to humans (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: understand and describe the impacts of environmental change and the causes and consequences of biodiversity loss (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: appreciate and describe the ecological principles underlying different policies and plans for biodiversity conservation and sustainable development in Hong Kong and elsewhere (by means of coursework, tutorial classes and laboratorybased learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity

Major in Ecology & Biodiversity (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Core Courses (12 credits)

BIOL1309 Evolutionary diversity (6) **BIOL2306** Ecology and evolution (6)

2. Advanced level courses (24 credits)

Dis

ciplinary Electives (24 credits)		
BIOL3101	Animal behaviour (6)	
BIOL3301	Marine biology (6)	
BIOL3302	Systematics and phylogenetics (6)	
BIOL3303	Conservation biology (6)	
BIOL3313	Freshwater ecology (6)	
BIOL3314	Plant structure and evolution (6)	
BIOL3318	Experimental intertidal ecology (6)	
BIOL3319	Tropical terrestrial ecology (6)	
BIOL3419	Insect ecology: the little things that run the world (6)	
BIOL3506	Evolutionary biology (6)	
BIOL4301	Fish and fisheries (6)	
BIOL4302	Environmental impact assessment (6)	

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2019

admitted to Year 1 in

Objectives:

This Minor in Ecology & Biodiversity is an ideal introduction to the natural world, the species and ecosystems it comprises and the biological rules it follows. It aims to allow students to learn about general ecological principles and the local flora and fauna of the region, and the conservation challenges that will need to be addressed in a rapidly-changing world. Students will be able to build upon this basic knowledge developed at the introductory level by selecting from among a wide range of courses that offer learning opportunities through practical and field work, as well as traditional and virtual teaching, in more specialized areas of ecology and biodiversity.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate and describe the importance of ecology and biodiversity, and the importance of the variety of life to humans (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: understand and describe the impacts of environmental change and the causes and consequences of biodiversity loss (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: appreciate and describe the ecological principles underlying different policies and plans for biodiversity conservation and sustainable development in Hong Kong and elsewhere (by means of coursework, tutorial classes and laboratorybased learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity

Major in Ecology & Biodiversity (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Core Courses (12 credits)

BIOL1309 Evolutionary diversity (6) Ecology and evolution (6)

2. Advanced level courses (24 credits)

Disc

ciplinary Electives	(24 credits)
BIOL3101	Animal behaviour (6)
BIOL3301	Marine biology (6)
BIOL3302	Systematics and phylogenetics (6)
BIOL3303	Conservation biology (6)
BIOL3313	Freshwater ecology (6)
BIOL3314	Plant structure and evolution (6)
BIOL3318	Experimental intertidal ecology (6)
BIOL3319	Tropical terrestrial ecology (6)
BIOL3419	Insect ecology: the little things that run the world (6)
BIOL3506	Evolutionary biology (6)
BIOL4301	Fish and fisheries (6)
BIOL4302	Environmental impact assessment (6)

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2018

admitted to Year 1 in

Objectives:

This Minor in Ecology & Biodiversity is an ideal introduction to the natural world, the species and ecosystems it comprises and the biological rules it follows. It aims to allow students to learn about general ecological principles and the local flora and fauna of the region, and the conservation challenges that will need to be addressed in a rapidly-changing world. Students will be able to build upon this basic knowledge developed at the introductory level by selecting from among a wide range of courses that offer learning opportunities through practical and field work, as well as traditional and virtual teaching, in more specialized areas of ecology and biodiversity.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate and describe the importance of ecology and biodiversity, and the importance of the variety of life to humans (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: understand and describe the impacts of environmental change and the causes and consequences of biodiversity loss (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: appreciate and describe the ecological principles underlying different policies and plans for biodiversity conservation and sustainable development in Hong Kong and elsewhere (by means of coursework, tutorial classes and laboratorybased learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity

Major in Ecology & Biodiversity (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Core Courses (12 credits)

BIOL1309 Evolutionary diversity (6) **BIOL2306** Ecology and evolution (6)

2. Advanced level courses (24 credits)

Dis

ciplinary Electives (24 credits)			
BIOL3101	Animal behaviour (6)		
BIOL3301	Marine biology (6)		
BIOL3302	Systematics and phylogenetics (6)		
BIOL3303	Conservation biology (6)		
BIOL3313	Freshwater ecology (6)		
BIOL3314	Plant structure and evolution (6)		
BIOL3318	Experimental intertidal ecology (6)		
BIOL3319	Tropical terrestrial ecology (6)		
BIOL3419	Insect ecology: the little things that run the world (6)		
BIOL3506	Evolutionary biology (6)		
BIOL4301	Fish and fisheries (6)		
BIOL4302	Environmental impact assessment (6)		

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2017

admitted to Year 1 in

Objectives:

This Minor in Ecology & Biodiversity is an ideal introduction to the natural world, the species and ecosystems it comprises and the biological rules it follows. It aims to allow students to learn about general ecological principles and the local flora and fauna of the region, and the conservation challenges that will need to be addressed in a rapidly-changing world. Students will be able to build upon this basic knowledge developed at the introductory level by selecting from among a wide range of courses that offer learning opportunities through practical and field work, as well as traditional and virtual teaching, in more specialized areas of ecology and biodiversity.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate and describe the importance of ecology and biodiversity, and the importance of the variety of life to humans (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: understand and describe the impacts of environmental change and the causes and consequences of biodiversity loss (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: appreciate and describe the ecological principles underlying different policies and plans for biodiversity conservation and sustainable development in Hong Kong and elsewhere (by means of coursework, tutorial classes and laboratorybased learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity

Major in Ecology & Biodiversity (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Core Courses (12 credits)

BIOL1309 Evolutionary diversity (6) **BIOL2306** Ecology and evolution (6)

2. Advanced level courses (24 credits)

Disc

ciplinary Electives	(24 credits)
BIOL3101	Animal behaviour (6)
BIOL3301	Marine biology (6)
BIOL3302	Systematics and phylogenetics (6)
BIOL3303	Conservation biology (6)
BIOL3313	Freshwater ecology (6)
BIOL3314	Plant structure and evolution (6)
BIOL3318	Experimental intertidal ecology (6)
BIOL3319	Tropical terrestrial ecology (6)
BIOL3419	Insect ecology: the little things that run the world (6)
BIOL3506	Evolutionary biology (6)
BIOL4301	Fish and fisheries (6)
BIOL4302	Environmental impact assessment (6)

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2016

admitted to Year 1 in

Objectives:

This Minor in Ecology & Biodiversity is an ideal introduction to the natural world, the species and ecosystems it comprises and the biological rules it follows. It aims to allow students to learn about general ecological principles and the local flora and fauna of the region, and the conservation challenges that will need to be addressed in a rapidly-changing world. Students will be able to build upon this basic knowledge developed at the introductory level by selecting from among a wide range of courses that offer learning opportunities through practical and field work, as well as traditional and virtual teaching, in more specialized areas of ecology and biodiversity.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate and describe the importance of ecology and biodiversity, and the importance of the variety of life to humans (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: understand and describe the impacts of environmental change and the causes and consequences of biodiversity loss (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: appreciate and describe the ecological principles underlying different policies and plans for biodiversity conservation and sustainable development in Hong Kong and elsewhere (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity

Major in Ecology & Biodiversity (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits) Disciplinary Core Courses (12 credits)

BIOL1309 Evolutionary diversity (6) BIOL2306 Ecology and evolution (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

BIOL3101	Animal behaviour (6)
BIOL3301	Marine biology (6)
BIOL3302	Systematics and phylogenetics (6)
BIOL3303	Conservation biology (6)
BIOL3313	Freshwater ecology (6)
BIOL3314	Plant structure and evolution (6)
BIOL3318	Experimental intertidal ecology (6)
BIOL3319	Tropical terrestrial ecology (6)
BIOL3320	The biology of marine mammals (6)
BIOL3419	Insect ecology: the little things that run the world (6)
BIOL3506	Evolutionary biology (6)
BIOL4301	Fish and fisheries (6)
BIOL4302	Environmental impact assessment (6)

Invarious title: Torrestrail applicat (6) 1

[previous title: Conservation ecology (6)]

[previous title: Terrestrail ecology (6)]

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

exclusive.

Minor Title Minor in Ecology & Biodiversity

Offered to students 2015

admitted to Year 1 in

Objectives:

This Minor in Ecology & Biodiversity is an ideal introduction to the natural world, the species and ecosystems it comprises and the biological rules it follows. It aims to allow students to learn about general ecological principles and the local flora and fauna of the region, and the conservation challenges that will need to be addressed in a rapidly-changing world. Students will be able to build upon this basic knowledge developed at the introductory level by selecting from among a wide range of courses that offer learning opportunities through practical and field work, as well as traditional and virtual teaching, in more specialized areas of ecology and biodiversity.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate and describe the importance of ecology and biodiversity, and the importance of the variety of life to humans (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: understand and describe the impacts of environmental change and the causes and consequences of biodiversity loss (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: appreciate and describe the ecological principles underlying different policies and plans for biodiversity conservation and sustainable development in Hong Kong and elsewhere (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity

BIOL3101

Major in Ecology & Biodiversity (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits) Disciplinary Core Courses (12 credits)

BIOL1309 Evolutionary diversity (6) BIOL2306 Ecology and evolution (6)

Animal behaviour (6)

2. Advanced level courses (24 credits) Disciplinary Electives (24 credits)

BIOLOTOT		this 24 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually exclusive.
BIOL3301	Marine biology (6)	
BIOL3302	Systematics and phylogenetics (6)	
BIOL3303	Conservation biology (6)	[previous title: Conservation ecology (6)]
BIOL3313	Freshwater ecology (6)	
BIOL3314	Plant structure and evolution (6)	
BIOL3318	Experimental intertidal ecology (6)	
BIOL3319	Tropical terrestrial ecology (6)	[previous title: Terrestrial ecology (6)]
BIOL3320	The biology of marine mammals (6)	
BIOL3419	Insect ecology: the little things that run the world (6)	
BIOL3506	Evolutionary biology (6)	
BIOL4301	Fish and fisheries (6)	
BIOL4302	Environmental impact assessment (6)	
BIOL4303	Animal behaviour (6)	Take either BIOL3101 or BIOL4303 to fulfill this 24 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually

Notes

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

exclusive.

Minor Title Minor in Ecology & Biodiversity

Offered to students 2014

admitted to Year 1 in

Objectives:

This Minor in Ecology & Biodiversity is an ideal introduction to the natural world, the species and ecosystems it comprises and the biological rules it follows. It aims to allow students to learn about general ecological principles and the local flora and fauna of the region, and the conservation challenges that will need to be addressed in a rapidly-changing world. Students will be able to build upon this basic knowledge developed at the introductory level by selecting from among a wide range of courses that offer learning opportunities through practical and field work, as well as traditional and virtual teaching, in more specialized areas of ecology and biodiversity.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate and describe the importance of ecology and biodiversity, and the importance of the variety of life to humans (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: understand and describe the impacts of environmental change and the causes and consequences of biodiversity loss (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: appreciate and describe the ecological principles underlying different policies and plans for biodiversity conservation and sustainable development in Hong Kong and elsewhere (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity

BIOL3101

Major in Ecology & Biodiversity (Intensive)

Required courses ((36 credits)
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1. Introductory level courses (12 credits) Disciplinary Core Courses (12 credits)

BIOL1309 Evolutionary diversity (6)
BIOL2306 Ecology and evolution (6)

Animal behaviour (6)

2. Advanced level courses (24 credits) Disciplinary Electives (24 credits)

		this 24 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually exclusive.
BIOL3301	Marine biology (6)	
BIOL3302	Systematics and phylogenetics (6)	
BIOL3303	Conservation biology (6)	[previous title: Conservation ecology (6)]
BIOL3313	Freshwater ecology (6)	
BIOL3314	Plant structure and evolution (6)	
BIOL3318	Experimental intertidal ecology (6)	
BIOL3319	Tropical terrestrial ecology (6)	[previous title: Terrestrial ecology (6)]
BIOL3320	The biology of marine mammals (6)	
BIOL3419	Insect ecology: the little things that run the world (6)	
BIOL4301	Fish and fisheries (6)	
BIOL4302	Environmental impact assessment (6)	
BIOL4303	Animal behaviour (6)	Take either BIOL3101 or BIOL4303 to fulfill this 24 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

exclusive

Minor Title Minor in Ecology & Biodiversity

Offered to students 2013

admitted to Year 1 in

Objectives:

This Minor in Ecology & Biodiversity is an ideal introduction to the natural world, the species and ecosystems it comprises and the biological rules it follows. It aims to allow students to learn about general ecological principles and the local flora and fauna of the region, and the conservation challenges that will need to be addressed in a rapidly-changing world. Students will be able to build upon this basic knowledge developed at the introductory level by selecting from among a wide range of courses that offer learning opportunities through practical and field work, as well as traditional and virtual teaching, in more specialized areas of ecology and biodiversity.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate and describe the importance of ecology and biodiversity, and the importance of the variety of life to humans (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: understand and describe the impacts of environmental change and the causes and consequences of biodiversity loss (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: appreciate and describe the ecological principles underlying different policies and plans for biodiversity conservation and sustainable development in Hong Kong and elsewhere (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity

Major in Ecology & Biodiversity (Intensive)

Required courses (36 credit	s)
1. Introductory level courses (12

Disciplinary Core Courses (12 credits)
BIOL 1309 Evolutionary diversity (6)

BIOL2306 Ecology and evolution (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits) BIOL3101 Animal behaviour (6)

BIOLOTOT		this 24 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually exclusive.
BIOL3301	Marine biology (6)	
BIOL3302	Systematics and phylogenetics (6)	
BIOL3303	Conservation biology (6)	[previous title: Conservation ecology (6)]
BIOL3313	Freshwater ecology (6)	
BIOL3314	Plant structure and evolution (6)	
BIOL3318	Experimental intertidal ecology (6)	
BIOL3319	Tropical terrestrial ecology (6)	[previous title: Terrestrial ecology (6)]
BIOL3320	The biology of marine mammals (6)	
BIOL3419	Insect ecology: the little things that run the world (6)	
BIOL4301	Fish and fisheries (6)	
BIOL4302	Environmental impact assessment (6)	
BIOL4303	Animal behaviour (6)	Take either BIOL3101 or BIOL4303 to fulfill this 24 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

exclusive.

Minor Title Minor in Ecology & Biodiversity

Offered to students 2012

admitted to Year 1 in

Objectives:

This Minor in Ecology & Biodiversity is an ideal introduction to the natural world, the species and ecosystems it comprises and the biological rules it follows. It aims to allow students to learn about general ecological principles and the local flora and fauna of the region, and the conservation challenges that will need to be addressed in a rapidly-changing world. Students will be able to build upon this basic knowledge developed at the introductory level by selecting from among a wide range of courses that offer learning opportunities through practical and field work, as well as traditional and virtual teaching, in more specialized areas of ecology and biodiversity.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate and describe the importance of ecology and biodiversity, and the importance of the variety of life to humans (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: understand and describe the impacts of environmental change and the causes and consequences of biodiversity loss (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: appreciate and describe the ecological principles underlying different policies and plans for biodiversity conservation and sustainable development in Hong Kong and elsewhere (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Ecology & Biodiversity

BIOL3101

Major in Ecology & Biodiversity (Intensive)

Required	courses	(36 credits)
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1. Introductory level courses (12 credits) Disciplinary Core Courses (12 credits)

BIOL1309 Evolutionary diversity (6)
BIOL2306 Ecology and evolution (6)

Animal behaviour (6)

2. Advanced level courses (24 credits) Disciplinary Electives (24 credits)

,a 25.1211041 (c)	this 24 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually exclusive.
Marine biology (6)	
Systematics and phylogenetics (6)	
Conservation biology (6)	[previous title: Conservation ecology (6)]
Freshwater ecology (6)	
Plant structure and evolution (6)	
Experimental intertidal ecology (6)	
Tropical terrestrial ecology (6)	[previous title: Terrestrial ecology (6)]
The biology of marine mammals (6)	
Insect ecology: the little things that run the world (6)	
Fish and fisheries (6)	
Environmental impact assessment (6)	
Animal behaviour (6)	Take either BIOL3101 or BIOL4303 to fulfill this 24 credits requirement, but not both. BIOL3101 and BIOL4303 are mutually
	Marine biology (6) Systematics and phylogenetics (6) Conservation biology (6) Freshwater ecology (6) Plant structure and evolution (6) Experimental intertidal ecology (6) Tropical terrestrial ecology (6) The biology of marine mammals (6) Insect ecology: the little things that run the world (6) Fish and fisheries (6) Environmental impact assessment (6)

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2020

admitted to Year 1 in

Objectives:

The Minor in Environmental Science aims to provide students with an introduction to some complex environmental issues. Students will gain ecological and physical knowledge of the environment, become literate in issues related to environmental sustainability, monitoring and management, and be able to explore interdisciplinary solutions to these problems. This training will help student understand certain aspects of the environment and possible ways to solving environmental problems which will be useful to students to enhance their career prospects.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Major in Environmental Science

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (6 credits)

ENVS1401 Introduction to environmental science (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses (Level 1 & 2):

CHEM1042 General chemistry I (6)

EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)

ENVS1301 Environmental life science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3110 Environmental toxicology (6)
BIOL3303 Conservation biology (6)

BIOL4302 Environmental impact assessment (6)

CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6) EASC3020 Global change: anthropogenic impacts (6)

EASC3405 Environmental remote sensing (6)
ENVS3007 Natural hazards and mitigation (6)
ENVS3010 Sustainable energy and environment (6)

ENVS3019 Urban ecology (6)

ENVS3020 Global change ecology (6)

ENVS3042 Pollution (6)

ENVS3202 Plant physiology and climate change (6) FNVS3313 Environmental oceanography (6)

ENVS3401 Understanding tropical ecosystems in a changing world (6)

ENVS4110 Environmental remediation (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2019

admitted to Year 1 in

Objectives:

The Minor in Environmental Science aims to provide students with an introduction to some complex environmental issues. Students will gain ecological and physical knowledge of the environment, become literate in issues related to environmental sustainability, monitoring and management, and be able to explore interdisciplinary solutions to these problems. This training will help student understand certain aspects of the environment and possible ways to solving environmental problems which will be useful to students to enhance their career prospects.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Major in Environmental Science

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (6 credits)

ENVS1401 Introduction to environmental science (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses (Level 1 & 2):

CHEM1042 General chemistry I (6)

EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)

ENVS1301 Environmental life science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3110 Environmental toxicology (6) BIOL3303 Conservation biology (6)

BIOL4302 Environmental impact assessment (6)

CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6) EASC3020 Global change: anthropogenic impacts (6)

EASC3020 Global change: anthropogenic impact EASC3405 Environmental remote sensing (6) ENVS3007 Natural hazards and mitigation (6)

ENVS3017 Natural nazards and mitigation (6)
ENVS3010 Sustainable energy and environment (6)

ENVS3019 Urban ecology (6) ENVS3020 Global change ecology (6)

ENVS3042 Pollution (6)

ENVS3313 Environmental oceanography (6) ENVS4110 Environmental remediation (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2018

admitted to Year 1 in

Objectives:

The Minor in Environmental Science aims to provide students with an introduction to some complex environmental issues. Students will gain ecological and physical knowledge of the environment, become literate in issues related to environmental sustainability, monitoring and management, and be able to explore interdisciplinary solutions to these problems. This training will help student understand certain aspects of the environment and possible ways to solving environmental problems which will be useful to students to enhance their career prospects.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Major in Environmental Science

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (6 credits)

ENVS1401 Introduction to environmental science (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses (Level 1 & 2):

CHEM1042 General chemistry I (6)

EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)

ENVS1301 Environmental life science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3110 Environmental toxicology (6) BIOL3303 Conservation biology (6)

BIOL4302 Environmental impact assessment (6)

CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6) EASC3020 Global change: anthropogenic impacts (6)

EASC3020 Global change: anthropogenic impacts (6)
EASC3405 Environmental remote sensing (6)
ENVS3007 Natural hazards and mitigation (6)
ENVS3010 Sustainable energy and environment (6)

ENVS3019 Urban ecology (6)

ENVS3020 Global change ecology (6)

ENVS3042 Pollution (6)

ENVS3313 Environmental oceanography (6) ENVS4110 Environmental remediation (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2017

admitted to Year 1 in

Objectives:

The Minor in Environmental Science aims to provide students with an introduction to some complex environmental issues. Students will gain ecological and physical knowledge of the environment, become literate in issues related to environmental sustainability, monitoring and management, and be able to explore interdisciplinary solutions to these problems. This training will help student understand certain aspects of the environment and possible ways to solving environmental problems which will be useful to students to enhance their career prospects.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Major in Environmental Science

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (6 credits)

ENVS1401 Introduction to environmental science (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses (Level 1 & 2):

CHEM1042 General chemistry I (6)
CHEM2041 Principles of chemistry I (6)
CHEM2241 Analytical chemistry I (6)

CHEM2442 Fundamentals of organic chemistry (6)
EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)

ENVS1301 Environmental life science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3110 Environmental toxicology (6)
BIOL3303 Conservation biology (6)

BIOL4302 Environmental impact assessment (6)

CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3242 Food and water analysis (6)

EASC3020 Global change: anthropogenic impacts (6)
EASC3405 Environmental remote sensing (6)
ENVS3006 Environmental radiation (6)
ENVS3007 Natural hazards and mitigation (6)

ENVS3010 Sustainable energy and environment (6)
ENVS3019 Urban ecology (6)
ENVS3020 Global change ecology (6)

ENVS3042 Pollution (6)

ENVS3313 Environmental oceanography (6) ENVS4110 Environmental remediation (6)

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2016

admitted to Year 1 in

Objectives:

The Minor in Environmental Science aims to provide students with an introduction to some complex environmental issues. Students will gain ecological and physical knowledge of the environment, become literate in issues related to environmental sustainability, monitoring and management, and be able to explore interdisciplinary solutions to these problems. This training will help student understand certain aspects of the environment and possible ways to solving environmental problems which will be useful to students to enhance their career prospects.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Major in Environmental Science

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (6 credits)

Introduction to environmental science (6) ENVS1401

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses (Level 1 & 2):

General chemistry I (6) CHEM1042 CHEM2041 Principles of chemistry (6) Analytical chemistry I (6) CHEM2241

CHEM2442 Fundamentals of organic chemistry (6) EASC1020 Introduction to climate science (6)

Blue Planet (6) EASC1401

EASC2404 Introduction to atmosphere and hydrosphere (6)

Environmental life science (6) ENVS1301 ENVS2001 Methods in environmental science (6) ENVS2002 Environmental data analysis (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (6 credits)

Environment, society and economics (6) ENVS3004

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

Environmental toxicology (6) BIOL3110 BIOL3303 Conservation biology (6)

Environmental impact assessment (6) **BIOI 4302**

Environmental chemistry (6) CHEM3141

Analytical chemistry II: chemical instrumentation (6) CHEM3241

Food and water analysis (6) CHEM3242

EASC3020 Global change: anthropogenic impacts (6) Environmental remote sensing (6) FASC3405 ENVS3006 Environmental radiation (6)

Natural hazards and mitigation (6) ENVS3007 ENVS3010 Sustainable energy and environment (6) ENVS3019 Urban ecology (6)

ENVS3020 Global change ecology (6)

ENVS3042 Pollution (6)

ENVS3313 Environmental oceanography (6) Environmental remediation (6) ENVS4110

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2015

admitted to Year 1 in

Objectives:

The Minor in Environmental Science aims to provide students with an introduction to some complex environmental issues. Students will gain ecological and physical knowledge of the environment, become literate in issues related to environmental sustainability, monitoring and management, and be able to explore interdisciplinary solutions to these problems. This training will help student understand certain aspects of the environment and possible ways to solving environmental problems which will be useful to students to enhance their career prospects.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Major in Environmental Science

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (6 credits)

ENVS1401 Introduction to environmental science (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses (Level 1 & 2):

CHEM1042 General chemistry I (6)
CHEM2041 Principles of chemistry I (6)
CHEM2241 Analytical chemistry I (6)

CHEM2442 Fundamentals of organic chemistry (6) EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)

ENVS1301 Environmental life science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3110 Environmental toxicology (6)
BIOL3303 Conservation biology (6)

BIOL4302 Environmental impact assessment (6)

CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3242 Food and water analysis (6)
EASC3020 Global change: anthropogenic impacts (6)

EASC3020 Global change: anthropogenic impacts (
EASC3405 Environmental remote sensing (6)
ENVS3006 Environmental radiation (6)
ENVS3007 Natural hazards and mitigation (6)

ENVS3010 Sustainable energy and environment (6)
ENVS3019 Urban ecology (6)
ENVS3020 Global change ecology (6)

ENVS3042 Pollution (6)

ENVS3313 Environmental oceanography (6) ENVS4110 Environmental remediation (6)

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2014

admitted to Year 1 in

Objectives:

The Minor in Environmental Science aims to provide students with an introduction to some complex environmental issues. Students will gain ecological and physical knowledge of the environment, become literate in issues related to environmental sustainability, monitoring and management, and be able to explore interdisciplinary solutions to these problems. This training will help student understand certain aspects of the environment and possible ways to solving environmental problems which will be useful to students to enhance their career prospects.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Major in Environmental Science

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (6 credits)

ENVS1401 Introduction to environmental science (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses (Level 1 & 2):

CHEM1042 General chemistry I (6)
CHEM2041 Principles of chemistry I (6)
CHEM2241 Analytical chemistry I (6)

CHEM2442 Fundamentals of organic chemistry (6)
EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)

ENVS1301 Environmental life science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3110 Environmental toxicology (6)
BIOL3303 Conservation biology (6)

BIOL4302 Environmental impact assessment (6)

CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3242 Food and water analysis (6)

EASC3020 Global change: anthropogenic impacts (6)
EASC3405 Environmental remote sensing (6)
ENVS3006 Environmental radiation (6)
ENVS3007 Natural hazards and mitigation (6)

ENVS3010 Sustainable energy and environment (6) ENVS3019 Urban ecology (6)

ENVS3020 Global change ecology (6)

ENVS3042 Pollution (6)

ENVS3313 Environmental oceanography (6) ENVS4110 Environmental remediation (6)

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2013

admitted to Year 1 in

Objectives:

The Minor in Environmental Science aims to provide students with an introduction to some complex environmental issues. Students will gain ecological and physical knowledge of the environment, become literate in issues related to environmental sustainability, monitoring and management, and be able to explore interdisciplinary solutions to these problems. This training will help student understand certain aspects of the environment and possible ways to solving environmental problems which will be useful to students to enhance their career prospects.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Major in Environmental Science

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (6 credits)

ENVS1401 Introduction to environmental science (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses (Level 1 & 2):

CHEM1042 General chemistry I (6)
CHEM2041 Principles of chemistry I (6)
CHEM2241 Analytical chemistry I (6)

CHEM2442 Fundamentals of organic chemistry (6) EASC1020 Introduction to climate science (6)

EASC1401 Blue Planet (6)

EASC2404 Introduction to atmosphere and hydrosphere (6)

ENVS1301 Environmental life science (6)
ENVS2001 Methods in environmental science (6)
ENVS2002 Environmental data analysis (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3110 Environmental toxicology (6)
BIOL3303 Conservation biology (6)

BIOL4302 Environmental impact assessment (6)

CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3242 Food and water analysis (6)

EASC3020 Global change: anthropogenic impacts (6)
EASC3405 Environmental remote sensing (6)
ENVS3006 Environmental radiation (6)

ENVS3007 Natural hazards and mitigation (6)
ENVS3010 Sustainable energy and environment (6)
ENVS3019 Urban ecology (6)

ENVS3020 Global change ecology (6)

ENVS3042 Pollution (6)

ENVS3313 Environmental oceanography (6) ENVS4110 Environmental remediation (6)

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Offered to students 2012

admitted to Year 1 in

Objectives:

The Minor in Environmental Science aims to provide students with an introduction to some complex environmental issues. Students will gain ecological and physical knowledge of the environment, become literate in issues related to environmental sustainability, monitoring and management, and be able to explore interdisciplinary solutions to these problems. This training will help student understand certain aspects of the environment and possible ways to solving environmental problems which will be useful to students to enhance their career prospects.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe different components of the environmental systems and key issues in environmental science (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 2: observe, describe, measure and analyze physical, biological and chemical characteristics of natural and man-made environments (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 3: appropriately use and critically analyze a range of forms and sources of environmental data, and assess environmental problems (by means of lectures, coursework, tutorial classes and field/ laboratory/ team-based learning in the curriculum)
- PLO 4: gain skills in scientific inquiry and effective communication of global environmental problems, issues of resource management, policies and management methods (by means of field/ laboratory/ team-based learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combinations:

Major in Environmental Science

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (6 credits)

ENVS1401 Introduction to environmental science (6)

Disciplinary Electives (12 credits)

At least 6 credits selected from the following courses (Level 1) in List A:

List A

CHEM1042 General chemistry I (6) EASC1401 Blue Planet (6)

ENVS1301 Environmental life science (6)

At least 6 credits selected from the following courses (Level 2) in List B:

List B

BIOL2102 Biostatistics (6)
CHEM2041 Principles of chemistry (6)
CHEM2241 Analytical chemistry I (6)

CHEM2442 Fundamentals of organic chemistry (6)
EASC2404 Introduction to atmosphere and hydrosphere (6)
ENVS2001 Methods in environmental science (6)

ENVS2001 Environmental data analysis (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (6 credits)

ENVS3004 Environment, society and economics (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3110 Environmental toxicology (6) BIOL3303 Conservation biology (6)

BIOL4302 Environmental impact assessment (6)

CHEM3141 Environmental chemistry (6)

CHEM3241 Analytical chemistry II: chemical instrumentation (6)

CHEM3242 Food and water analysis (6)
EASC3020 Global change: anthropogenic impacts (6)

EASC3405 Environmental remote sensing (6)
ENVS3006 Environmental radiation (6)
ENVS3007 Natural hazards and mitigation (6)
ENVS3010 Sustainable energy and environment (6)

ENVS3019 Urban ecology (6) ENVS3020 Global change ecology (6)

ENVS3042 Pollution (6)

ENVS3313 Environmental oceanography (6) ENVS4110 Environmental remediation (6)

Notes:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Minor Title Minor in Food & Nutritional Science

Offered to students

2020

admitted to Year 1 in

Objectives:

The Minor in Food and Nutritional Science aims to provide a comprehensive education in food, nutrition and related sociological and technological topics, enabling graduates to develop their interest in food and nutrition and have a wide range of employment and progression options.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate broad knowledge in the field of food and nutritional science (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: recognize and describe the health risks associated with food and specific nutrients, and discuss how to prevent these risks (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand and describe ethical perspectives and practice in food product development, food safety and public health nutrition (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: synthesize and summarize information from a wide range of sources and draw reasoned conclusions with particular reference to food and nutritional sciences and related global and commercial issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Food & Nutritional Science

Requirea	courses	(36	creaits)	

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

ALIGASE 12 CIEC	ns selected from the following courses.
BIOL1110	From molecules to cells (6)
BIOL1201	Introduction to food and nutrition (6)
BIOL2101	Principles of food chemistry (6)
DIOI 0000	Duin sinds a of his shausistus (C)

At least 12 credits selected from the following courses:

BIOL2220 Principles of biochemistry (6)

Take either BIOL2220 or BIOC2600 o fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

BIOC2600 Basic biochemistry (6)

Take either BIOL2220 or BIOC2600 o fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

2. Advanced level courses (24 credits) **Disciplinary Electives (24 credits)**

At least 24 credits selected from the following courses: BIOL3202 Nutritional biochemistry (6)

BIOL3203	Food microbiology (6)
BIOL3204	Nutrition and the life cycle (6)
BIOL3205	Human physiology (6)
BIOL3207	Principles of toxicology (6)
BIOL3209	Food and nutrient analysis (6)
BIOL3211	Nutrigenomics (6)
BIOL3216	Food waste management (6)
BIOL3217	Food, environment and health (6)
BIOL3218	Food hygiene and quality control (6)
BIOL3606	Diet and disease (6)
BIOL3608	Food commodities (6)
DIOL 4004	D. I. I I III (0)

[previous title: Food and nutritional toxicology (6)1

BIOL4201 Public health nutrition (6)

Nutrition and sports performance (6) BIOL4202 BIOL4205

Food technology (6)

BIOL4209 Functional foods (6)

BIOL4411 Plant and food biotechnology (6) [previous title: Food processing and

engineering (6)]

Notes:

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Minor Title Minor in Food & Nutritional Science

Offered to students

2019

admitted to Year 1 in

Objectives:

The Minor in Food and Nutritional Science aims to provide a comprehensive education in food, nutrition and related sociological and technological topics, enabling graduates to develop their interest in food and nutrition and have a wide range of employment and progression options.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate broad knowledge in the field of food and nutritional science (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: recognize and describe the health risks associated with food and specific nutrients, and discuss how to prevent these risks (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand and describe ethical perspectives and practice in food product development, food safety and public health nutrition (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: synthesize and summarize information from a wide range of sources and draw reasoned conclusions with particular reference to food and nutritional sciences and related global and commercial issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Food & Nutritional Science

ı	Required course	s (36 credits)		
1. Introductory level courses (12 credits)				
ı	Disciplinary Elect	ives (12 credits)		
ı	At least 12 credi	its selected from the following courses:		
ı	BIOL1110	From molecules to cells (6)		
ı	BIOL1201	Introduction to food and nutrition (6)		
ı	BIOI 2101	Principles of food chemistry (6)		

BIOL2101 Principles of food chemistry (6)

BIOL2220 Principles of biochemistry (6)

Take either BIOL2220 or BIOC2600 o fulfill this 12 credits requirement, but not both.

BIOL2220 and BIOC2600 are mutually

exclusive.

BIOC2600 Basic biochemistry (6) Take either BIOL2220 or BIOC2600 o fulfill this 12 credits requirement, but not both.

BIOL2220 and BIOC2600 are mutually exclusive.

2. Advanced level courses (24 credits) Disciplinary Electives (24 credits)

BIOL3203

At least 24 credits selected from the following courses: BIOL3202 Nutritional biochemistry (6)

Food microbiology (6)

BIOL3204 BIOL3205 BIOL3207	Nutrition and the life cycle (6) Human physiology (6) Principles of toxicology (6)
BIOL3209 BIOL3211 BIOL3216 BIOL3217 BIOL3218 BIOL3606 BIOL3608 BIOL4201 BIOL4202 BIOL4204 BIOL4204	Food and nutrient analysis (6) Nutrigenomics (6) Food waste management (6) Food, environment and health (6) Food hygiene and quality control (6) Diet and disease (6) Food commodities (6) Public health nutrition (6) Nutrition and sports performance (6) Diet, brain function and behavior (6) Food technology (6)
DIOI 4200	Functional foods (6)

[previous title: Food and nutritional toxicology (6)]

[previous title: Food processing and engineering (6)]

BIOL4209 Functional foods (6)

BIOL4411 Plant and food biotechnology (6)

Notes:

Remarks

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Minor Title Minor in Food & Nutritional Science

Offered to students admitted to Year 1 in

2018

Objectives:

The Minor in Food and Nutritional Science aims to provide a comprehensive education in food, nutrition and related sociological and technological topics, enabling graduates to develop their interest in food and nutrition and have a wide range of employment and progression options.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate broad knowledge in the field of food and nutritional science (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: recognize and describe the health risks associated with food and specific nutrients, and discuss how to prevent these risks (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand and describe ethical perspectives and practice in food product development, food safety and public health nutrition (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: synthesize and summarize information from a wide range of sources and draw reasoned conclusions with particular reference to food and nutritional sciences and related global and commercial issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Food & Nutritional Science

Major III I dou & Nutritional Science				
Required courses (36 credits)				
	vel courses (12 credits)			
Disciplinary Electives (12 credits)				
	its selected from the following courses:			
BIOL1110	From molecules to cells (6)			
BIOL1201	Introduction to food and nutrition (6)			
BIOL2101	Principles of food chemistry (6)			
BIOL2220	Principles of biochemistry (6)	Take either BIOL2220 or BIOC2600 o fulfill		
DIOLZZZO	Timopies of biochemistry (0)	this 12 credits requirement, but not both.		
		BIOL2220 and BIOC2600 are mutually		
		exclusive.		
BIOC2600	Basic biochemistry (6)	Take either BIOL2220 or BIOC2600 o fulfill		
		this 12 credits requirement, but not both.		
		BIOL2220 and BIOC2600 are mutually		
		exclusive.		
	courses (24 credits)			
Disciplinary Elect				
	ts selected from the following courses:			
BIOL3202	Nutritional biochemistry (6)			
BIOL3203	Food microbiology (6)			
BIOL3204	Nutrition and the life cycle (6)			
BIOL3205	Human physiology (6)			
BIOL3206	Clinical nutrition (6)	Take either BIOL3206 or BIOL3606 to fulfill		
		this 24 credits requirement, but not both.		
		BIOL3206 and BIOL3606 are mutually		
DIOI 2007	Dringiples of toyingle gy (6)	exclusive.		
BIOL3207	Principles of toxicology (6)	[previous title: Food and nutritional toxicology (6)]		
BIOL3209	Food and nutrient analysis (6)	(0)]		
BIOL3211	Nutrigenomics (6)			
BIOL3216	Food waste management (6)			
BIOL3217	Food, environment and health (6)			
BIOL3218	Food hygiene and quality control (6)			
BIOL3606	Diet and disease (6)	Take either BIOL3206 or BIOL3606 to fulfill		
DIOL3000	Diet and disease (0)	this 24 credits requirement, but not both.		
		BIOL3206 and BIOL3606 are mutually		
		exclusive.		
BIOL3608	Food commodities (6)	Take either BIOL3608 or BIOL4208 to fulfill		
		this 24 credits requirement, but not both.		
		BIOL3608 and BIOL4208 are mutually		
DIOL 1001	Dublic becally mediation (0)	exclusive.		
BIOL4201	Public health nutrition (6)			
BIOL4202	Nutrition and sports performance (6)			
BIOL4204	Diet, brain function and behavior (6)			
BIOL4205	Food technology (6)	[previous title: Food processing and		
BIOL4208	Meat, dairy and grain sciences (6)	engineering (6)] Take either BIOL3608 or BIOL4208 to fulfill		
DIOL4200	Meat, daily and grain sciences (0)	this 24 credits requirement, but not both.		
		BIOL3608 and BIOL4208 are mutually		
		exclusive.		
BIOL4209	Functional foods (6)			
BIOL4411	Plant and food biotechnology (6)			

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks

Minor Title Minor in Food & Nutritional Science

Offered to students

2017

admitted to Year 1 in

Objectives:

The Minor in Food and Nutritional Science aims to provide a comprehensive education in food, nutrition and related sociological and technological topics, enabling graduates to develop their interest in food and nutrition and have a wide range of employment and progression options.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate broad knowledge in the field of food and nutritional science (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: recognize and describe the health risks associated with food and specific nutrients, and discuss how to prevent these risks (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand and describe ethical perspectives and practice in food product development, food safety and public health nutrition (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: synthesize and summarize information from a wide range of sources and draw reasoned conclusions with particular reference to food and nutritional sciences and related global and commercial issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Food & Nutritional Science

Required courses (36 credits)					
1. Introductory level courses (12 credits)					
Disciplinary Electives (12 credits)					
	its selected from the following courses:				
BIOL1110	From molecules to cells (6)				
BIOL1201	Introduction to food and nutrition (6)				
BIOL2101	Principles of food chemistry (6)				
BIOL2220	Principles of biochemistry (6)	Take either BIOL2220 or BIOC2600 o fulfill			
DIOLZZZO	Timopies of bloomermatry (o)	this 12 credits requirement, but not both.			
		BIOL2220 and BIOC2600 are mutually			
		exclusive.			
BIOC2600	Basic biochemistry (6)	Take either BIOL2220 or BIOC2600 o fulfill			
		this 12 credits requirement, but not both.			
		BIOL2220 and BIOC2600 are mutually			
		exclusive.			
	courses (24 credits)				
Disciplinary Elect					
	its selected from the following courses:				
BIOL3202	Nutritional biochemistry (6)				
BIOL3203	Food microbiology (6)				
BIOL3204	Nutrition and the life cycle (6)				
BIOL3205	Human physiology (6)				
BIOL3206	Clinical nutrition (6)	Take either BIOL3206 or BIOL3606 to fulfill			
		this 24 credits requirement, but not both.			
		BIOL3206 and BIOL3606 are mutually			
	5	exclusive.			
BIOL3207	Principles of toxicology (6)	[previous title: Food and nutritional toxicology			
DIOL 2200	Food and nutrient analysis (6)	(6)]			
BIOL3209	Food and nutrient analysis (6)				
BIOL3211	Nutrigenomics (6)				
BIOL3216	Food waste management (6)				
BIOL3217	Food, environment and health (6)				
BIOL3218	Food hygiene and quality control (6)				
BIOL3606	Diet and disease (6)	Take either BIOL3206 or BIOL3606 to fulfill			
		this 24 credits requirement, but not both.			
		BIOL3206 and BIOL3606 are mutually exclusive.			
BIOL3608	Food commodities (6)	Take either BIOL3608 or BIOL4208 to fulfill			
DIOLSOOO	1 dod commodities (0)	this 24 credits requirement, but not both.			
		BIOL3608 and BIOL4208 are mutually			
		exclusive.			
BIOL4201	Public health nutrition (6)				
BIOL4202	Nutrition and sports performance (6)				
BIOL4204	Diet, brain function and behavior (6)				
BIOL4205	Food technology (6)	[previous title: Food processing and			
2.02.20	37 (-7	engineering (6)]			
BIOL4208	Meat, dairy and grain sciences (6)	Take either BIOL3608 or BIOL4208 to fulfill			
	,	this 24 credits requirement, but not both.			
		BIOL3608 and BIOL4208 are mutually			
		exclusive.			
BIOL4209	Functional foods (6)				
BIOL4411	Plant and food biotechnology (6)				

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Food & Nutritional Science

Offered to students

2016

admitted to Year 1 in

Objectives:

The Minor in Food and Nutritional Science aims to provide a comprehensive education in food, nutrition and related sociological and technological topics, enabling graduates to develop their interest in food and nutrition and have a wide range of employment and progression options.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate broad knowledge in the field of food and nutritional science (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: recognize and describe the health risks associated with food and specific nutrients, and discuss how to prevent these risks (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand and describe ethical perspectives and practice in food product development, food safety and public health nutrition (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: synthesize and summarize information from a wide range of sources and draw reasoned conclusions with particular reference to food and nutritional sciences and related global and commercial issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Food & Nutritional Science

Required courses (36 credi

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

From molecules to cells (6) BIOL1110 Introduction to food and nutrition (6) BIOL1201 Principles of biochemistry (6) **BIOL2220**

BIOC2600 Basic biochemistry (6) Take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

2. Advanced level courses (24 credits) Disciplinary Electives (24 credits)

	50 (= : 0: 0 a.co,	
At least 24 credits	selected from the fo	llowing courses:

BIOL3201	Food chemistry (6)
BIOL3202	Nutritional biochemistry (6)
BIOL3203	Food microbiology (6)
BIOL3204	Nutrition and the life cycle (6)
BIOL3205	Human physiology (6)
BIOL3206	Clinical nutrition (6)

BIOL 3207 Principles of toxicology (6)

BIOL3208 Food safety and quality management (6)

Food and nutrient analysis (6) BIOL3209 BIOL3210 Grain production and utilization (6)

Nutrigenomics (6) BIOL3211 Food waste management (6) BIOL3216 **BIOL3217** Food, environment and health (6) Food hygiene and quality control (6) **BIOL3218**

BIOL3606 Diet and disease (6)

BIOL3608 Food commodities (6) Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually

exclusive. [previous title: Food and nutritional toxicology

(6)1Take either BIOL3208 or BIOL3218 to fulfill

this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.

Take either BIOL3210 or BIOL4208 or BIOL3608 to fulfill this 24 credits requirement, but not both. BIOL3210 and BIOL4208 or BIOL3608 are mutually exclusive.

Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.

Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually

exclusive. Take either BIOL3210 or BIOL4208 or

BIOL3608; BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3210, BIOL3608, BIOL4207 and BIOL4208 are mutually exclusive.

BIOL4201 BIOL4202 BIOL4204	Public health nutrition (6) Nutrition and sports performance (6) Diet, brain function and behavior (6)	
BIOL4205	Food technology (6)	[previous title: Food processing and engineering (6)]
BIOL4207	Meat and dairy sciences (6)	Take either BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3608, BIOL4207 and BIOL4208 are mutually exclusive.
BIOL4208	Meat, dairy and grain sciences (6)	Take either BIOL3210 or BIOL4208 or BIOL3608; BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3210, BIOL3608, BIOL4207 and BIOL4208 are mutually exclusive.
BIOL4209	Functional foods (6)	
BIOL4210	Food product development (6)	
BIOL4411	Plant and food biotechnology (6)	

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Food & Nutritional Science 2015

Offered to students

admitted to Year 1 in

Objectives:

The Minor in Food and Nutritional Science aims to provide a comprehensive education in food, nutrition and related sociological and technological topics, enabling graduates to develop their interest in food and nutrition and have a wide range of employment and progression options.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate broad knowledge in the field of food and nutritional science (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: recognize and describe the health risks associated with food and specific nutrients, and discuss how to prevent these risks (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand and describe ethical perspectives and practice in food product development, food safety and public health nutrition (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: synthesize and summarize information from a wide range of sources and draw reasoned conclusions with particular reference to food and nutritional sciences and related global and commercial issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Food & Nutritional Science

BIOC2600

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

From molecules to cells (6) BIOL1110 Introduction to food and nutrition (6) BIOL1201 BIOL2220 Principles of biochemistry (6)

Basic biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutaully

exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutaully

exclusive.

2. Advanced level courses (24 credits) **Disciplinary Electives (24 credits)**

At least 24 credits selected from the following courses: **BIOL 3201** Food chemistry (6)

DIOLOZOI	
BIOL3202	Nutritional biochemistry (6)
BIOL3203	Food microbiology (6)
BIOL3204	Nutrition and the life cycle (6)
BIOL3205	Human physiology (6)
BIOL3206	Clinical nutrition (6)

BIOL 3207 Principles of toxicology (6)

BIOL3208 Food safety and quality management (6)

Food and nutrient analysis (6) BIOL3209

BIOL3210 Grain production and utilization (6)

Nutrigenomics (6) BIOL3211

Food waste management (6) BIOL3216 **BIOL3217** Food, environment and health (6) Food hygiene and quality control (6) **BIOL3218**

BIOL3606 Diet and disease (6)

BIOL3608 Food commodities (6) Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually exclusive.

[previous title: Food and nutritional toxicology (6) 1

Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutaully exclusive.

Take either BIOL3210 or BIOL4208 or BIOL3608 to fulfill this 24 credits requirement, but not both. BIOL3210 and BIOL4208 or BIOL3608 are mutually exclusive.

Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutaully exclusive.

Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually exclusive.

Take either BIOL3210 or BIOL4208 or BIOL3608; BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3210, BIOL3608, BIOL4207 and BIOL4208 are mutually

exclusive.

BIOL4201 BIOL4202 BIOL4204	Public health nutrition (6) Nutrition and sports performance (6) Diet, brain function and behavior (6)	
BIOL4205	Food technology (6)	[previous title: Food processing and engineering (6)]
BIOL4207	Meat and dairy sciences (6)	Take either BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3608, BIOL4207 and BIOL4208 are mutually exclusive.
BIOL4208	Meat, dairy and grain sciences (6)	Take either BIOL3210 or BIOL4208 or BIOL3608; BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3210, BIOL3608, BIOL4207 and BIOL4208 are mutually exclusive.
BIOL4209	Functional foods (6)	
BIOL4210	Food product development (6)	
BIOL4411	Plant and food biotechnology (6)	

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Food & Nutritional Science

Offered to students

2014

admitted to Year 1 in

Objectives:

The Minor in Food and Nutritional Science aims to provide a comprehensive education in food, nutrition and related sociological and technological topics, enabling graduates to develop their interest in food and nutrition and have a wide range of employment and progression options.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate broad knowledge in the field of food and nutritional science (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: recognize and describe the health risks associated with food and specific nutrients, and discuss how to prevent these risks (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand and describe ethical perspectives and practice in food product development, food safety and public health nutrition (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: synthesize and summarize information from a wide range of sources and draw reasoned conclusions with particular reference to food and nutritional sciences and related global and commercial issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Food & Nutritional Science

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6)
BIOL1201 Introduction to food and nutrition (6)
BIOL2220 Principles of biochemistry (6)

BIOL2220 Principles of biochemistry (6)

BIOC2600 Basic biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusvie.

Take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusvie.

2. Advanced level courses (24 credits) Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3201 Food chemistry (6)
BIOL3202 Nutritional biochemistry (6)
BIOL3203 Food microbiology (6)
BIOL3204 Nutrition and the life cycle (6)
BIOL3205 Human physiology (6)
BIOL3206 Clinical nutrition (6)

BIOL3207 Principles of toxicology (6)

BIOL3208 Food safety and quality management (6)

BIOL3209 Food and nutrient analysis (6)

BIOL3210 Grain production and utilization (6)

BIOL3211 Nutrigenomics (6)

BIOL3216 Food waste management (6)
BIOL3217 Food, environment and health (6)
BIOL3218 Food hygiene and quality control (6)

BIOL3606 Diet and disease (6)

BIOL3608 Food commodities (6)

Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually exclusive.

[previous title: Food and nutritional toxicology (6)]

Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusvie.

Take either BIOL3210 or BIOL4208 or BIOL3608 to fulfill this 24 credits requirement, but not both. BIOL3210 and BIOL4208 or BIOL3608 are mutually exclusive.

Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusvie.

Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually

exclusive. Take either BIOL3210 or BIOL4208 or

BIOL3608; BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3210, BIOL3608, BIOL4207 and BIOL4208 are mutually exclusive.

BIOL4201 BIOL4202 BIOL4204	Public health nutrition (6) Nutrition and sports performance (6) Diet, brain function and behavior (6)	
BIOL4205	Food technology (6)	[previous title: Food processing and engineering (6)]
BIOL4207	Meat and dairy sciences (6)	Take either BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3608, BIOL4207 and BIOL4208 are mutually exclusive.
BIOL4208	Meat, dairy and grain sciences (6)	Take either BIOL3210 or BIOL4208 or BIOL3608; BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3210, BIOL3608, BIOL4207 and BIOL4208 are mutually exclusive.
BIOL4209	Functional foods (6)	
BIOL4210	Food product development (6)	
BIOL4411	Plant and food biotechnology (6)	

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Food & Nutritional Science

Offered to students

2013

admitted to Year 1 in

Objectives:

The Minor in Food and Nutritional Science aims to provide a comprehensive education in food, nutrition and related sociological and technological topics, enabling graduates to develop their interest in food and nutrition and have a wide range of employment and progression options.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate broad knowledge in the field of food and nutritional science (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: recognize and describe the health risks associated with food and specific nutrients, and discuss how to prevent these risks (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand and describe ethical perspectives and practice in food product development, food safety and public health nutrition (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: synthesize and summarize information from a wide range of sources and draw reasoned conclusions with particular reference to food and nutritional sciences and related global and commercial issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Food & Nutritional Science

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6)
BIOL1201 Introduction to food and nutrition (6)
BIOL2220 Principles of biochemistry (6)

BIOC2600 Basic biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses: BIOL3201 Food chemistry (6)

BIOL3202 Nutritional biochemistry (6)
BIOL3203 Food microbiology (6)
BIOL3204 Nutrition and the life cycle (6)
BIOL3205 Human physiology (6)
BIOL3206 Clinical nutrition (6)

BIOL3207 Principles of toxicology (6)

BIOL3208 Food safety and quality management (6)

BIOL3209 Food and nutrient analysis (6)

BIOL3210 Grain production and utilization (6)

BIOL3211 Nutrigenomics (6)

BIOL3216 Food waste management (6)
BIOL3217 Food, environment and health (6)
BIOL3218 Food hygiene and quality control (6)

BIOL3606 Diet and disease (6)

BIOL3608 Food commodities (6)

Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually exclusive.

[previous title: Food and nutritional toxicology (6)]

Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.

Take either BIOL3210 or BIOL4208 or BIOL3608 to fulfill this 24 credits requirement, but not both. BIOL3210 and BIOL4208 or BIOL3608 are mutually exclusive.

Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.

Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually

exclusive.

Take either BIOL3210 or BIOL4208 or BIOL3608; BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3210, BIOL3608, BIOL4207 and BIOL4208 are mutually

exclusive.

BIOL4201 BIOL4202 BIOL4204	Public health nutrition (6) Nutrition and sports performance (6) Diet, brain function and behavior (6)	
BIOL4205	Food technology (6)	[previous title: Food processing and engineering (6)]
BIOL4207	Meat and dairy sciences (6)	Take either BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3608, BIOL4207 and BIOL4208 are mutually exclusive.
BIOL4208	Meat, dairy and grain sciences (6)	Take either BIOL3210 or BIOL4208 or BIOL3608; BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3210, BIOL3608, BIOL4207 and BIOL4208 are mutually exclusive.
BIOL4209	Functional foods (6)	
BIOL4210	Food product development (6)	
BIOL4411	Plant and food biotechnology (6)	

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Food & Nutritional Science

Offered to students

2012

admitted to Year 1 in

Objectives:

The Minor in Food and Nutritional Science aims to provide a comprehensive education in food, nutrition and related sociological and technological topics, enabling graduates to develop their interest in food and nutrition and have a wide range of employment and progression options.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: demonstrate broad knowledge in the field of food and nutritional science (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 2: recognize and describe the health risks associated with food and specific nutrients, and discuss how to prevent these risks (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 3: understand and describe ethical perspectives and practice in food product development, food safety and public health nutrition (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)
- PLO 4: synthesize and summarize information from a wide range of sources and draw reasoned conclusions with particular reference to food and nutritional sciences and related global and commercial issues (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combinations:

BIOC2600

Major in Food & Nutritional Science

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

From molecules to cells (6) BIOL1110 Introduction to food and nutrition (6) BIOL1201 BIOL2220 Principles of biochemistry (6)

Basic biochemistry (6)

Take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

Take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

2. Advanced level courses (24 credits) **Disciplinary Electives (24 credits)**

At least 24 cred	s selected from the following cours	es:
BIOI 3201	Food chemistry (6)	

DIOLOZOI	r dod drieffildiry (d)
BIOL3202	Nutritional biochemistry (6)
BIOL3203	Food microbiology (6)
BIOL3204	Nutrition and the life cycle (6)
BIOL3205	Human physiology (6)
BIOL3206	Clinical nutrition (6)

BIOL 3207 Principles of toxicology (6)

BIOL3208 Food safety and quality management (6)

Food and nutrient analysis (6) BIOL3209

BIOL3210 Grain production and utilization (6)

Nutrigenomics (6) BIOL3211

Food waste management (6) BIOL3216 **BIOL3217** Food, environment and health (6) Food hygiene and quality control (6) **BIOL3218**

BIOL3606 Diet and disease (6)

BIOL3608 Food commodities (6) Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually exclusive.

[previous title: Food and nutritional toxicology (6) 1

Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.

Take either BIOL3210 or BIOL4208 or BIOL3608 to fulfill this 24 credits requirement, but not both. BIOL3210 and BIOL4208 or BIOL3608 are mutually

exclusive.

Take either BIOL3208 or BIOL3218 to fulfill this 24 credits requirement, but not both. BIOL3208 and BIOL3218 are mutually exclusive.

Take either BIOL3206 or BIOL3606 to fulfill this 24 credits requirement, but not both. BIOL3206 and BIOL3606 are mutually

exclusive.

Take either BIOL3210 or BIOL4208 or BIOL3608; BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3210, BIOL3608, BIOL4207 and BIOL4208 are mutually exclusive.

BIOL4201 BIOL4202 BIOL4204	Public health nutrition (6) Nutrition and sports performance (6) Diet, brain function and behavior (6)	
BIOL4205	Food technology (6)	[previous title: Food processing and engineering (6)]
BIOL4207	Meat and dairy sciences (6)	Take either BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3608, BIOL4207 and BIOL4208 are mutually exclusive.
BIOL4208	Meat, dairy and grain sciences (6)	Take either BIOL3210 or BIOL4208 or BIOL3608; BIOL4207 or BIOL4208 or BIOL3608 to fufill this 24 credits requirement, but not both. BIOL3210, BIOL3608, BIOL4207 and BIOL4208 are mutually exclusive.
BIOL4209	Functional foods (6)	
BIOL4210	Food product development (6)	
BIOL4411	Plant and food biotechnology (6)	

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Remarks:

Minor Title Minor in Marine Biology

Offered to students 2020

admitted to Year 1 in

Objectives:

The field of marine biology has become increasingly popular as interest in and awareness of our marine environment grows. Hong Kong already has strong cultural and historical links with the sea as well as a strong economic and societal interest in natural marine resources. This Minor aims to introduce students to the field of marine biology from species, habitat and ecosystem levels, ranging from the deep ocean to intertidal environments, and from both theoretical and practical perspectives. Material will be global and include organisms and their physical, behavioral and physiological adaptations to the marine environment, as well as techniques for marine study, Major marine issues will be covered including benefits derived from the marine environment and possible implications of climate change for marine systems. Particularly relevant examples from Hong Kong and the Southeast Asia region will be highlighted. This minor will provide students from diverse backgrounds (e.g.business, engineering and social science) an excellent opportunity to enter into a career or research in marine environmentrelated fields such as coastal ecosystem management, fisheries, marine environmental protection, marine resource management, etc.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate the requirements and constraints to life in different marine environments (by means of coursework. labtoratory-based, and tutorial classes and project-based learning in the curriculum)
- PLO 2: gain a comprehensive foundation for pursuing marine-orientated studies (by means of coursework, labtoratorybased, and tutorial classes and project-based learning in the curriculum)
- PLO 3: have a general insight into an ecosystem that covers two-thirds of the planet and supports the only remaining natural resource harvested on a large scale (by means of coursework, labtoratory-based, and tutorial classes and projectbased learning in the curriculum)
- PLO 4: understand the major marine issues both locally and globally (by means of coursework, labtoratory-based, and tutorial classes and project-based learning in the curriculum)
- PLO 5: appreciate the possible implications of climate change on marine systems (by means of coursework, labtoratorybased, and tutorial class and project-based learning in the curriculum)

Impermissible Combinations:

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1309 Evolutionary diversity (6) Environmental life science (6) FNVS1301 Ecology and evolution (6) BIOL2306

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

BIOL3301 Marine biology (6)

Environmental oceanography (6) **FNVS3313**

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL3303 Conservation biology (6)

Tropical and temperate marine ecology field course (6) **BIOL3305**

Experimental intertidal ecology (6) BIOL3318 Marine invertebrate zoology (6) BIOL3322

BIOL3328 Nearshore marine and estuarine ecology (6)

Fish and fisheries (6) BIOL4301

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc svllabuses.

Remarks:

Minor Title Minor in Marine Biology

Offered to students 2019

admitted to Year 1 in

Objectives:

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Learning Outcomes:

By the end of this programme, students should be able to:

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Impermissible Combinations:

NII

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1309 Evolutionary diversity (6)
ENVS1301 Environmental life science (6)
BIOL2306 Ecology and evolution (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

BIOL3301 Marine biology (6)

ENVS3313 Environmental oceanography (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL3303 Conservation biology (6)

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BIOL3318 Experimental intertidal ecology (6)
BIOL3322 Marine invertebrate zoology (6)

BIOL3328 Nearshore marine and estuarine ecology (6)

BIOL4301 Fish and fisheries (6)

Notes:

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Remarks:

Minor Title Minor in Marine Biology

Offered to students 2018

admitted to Year 1 in

Objectives:

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Impermissible Combinations:

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BIOL3328 Nearshore marine and estuarine ecology (6)

BIOL4301 Fish and fisheries (6)

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Remarks:

Minor Title Minor in Marine Biology

Offered to students 2017

admitted to Year 1 in

Objectives:

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Impermissible Combinations:

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1. Introductory level courses (12 credits)

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At least 12 credits selected from the following courses:

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Disciplinary Core Courses (12 credits)

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BIOL3328 Nearshore marine and estuarine ecology (6)

Fish and fisheries (6) BIOL4301

Notes:

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Remarks:

Minor Title Minor in Marine Biology

Offered to students 2016

admitted to Year 1 in

Objectives:

The field of marine biology has become increasingly popular as interest in and awareness of our marine environment grows. Hong Kong already has strong cultural and historical links with the sea as well as a strong economic and societal interest in natural marine resources. This Minor aims to introduce students to the field of marine biology from species, habitat and ecosystem levels, ranging from the deep ocean to intertidal environments, and from both theoretical and practical perspectives. Material will be global and include organisms and their physical, behavioral and physiological adaptations to the marine environment, as well as techniques for marine study, Major marine issues will be covered including benefits derived from the marine environment and possible implications of climate change for marine systems. Particularly relevant examples from Hong Kong and the Southeast Asia region will be highlighted. This minor will provide students from diverse backgrounds (e.g.business, engineering and social science) an excellent opportunity to enter into a career or research in marine environment-related fields such as coastal ecosystem management, fisheries, marine environmental protection, marine resource management, etc.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate the requirements and constraints to life in different marine environments (by means of coursework, labtoratory-based, and tutorial classes and project-based learning in the curriculum)
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Impermissible Combinations:

NII

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1309 Evolutionary diversity (6)
ENVS1301 Environmental life science (6)
BIOL2306 Ecology and evolution (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

BIOL3301 Marine biology (6)

ENVS3313 Environmental oceanography (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL3303 Conservation biology (6)

BIOL3305 Tropical and temperate marine ecology field course (6)

BIOL3318 Experimental intertidal ecology (6)
BIOL3320 The biology of marine mammals (6)
BIOL3322 Marine invertebrate zoology (6)

BIOL3328 Nearshore marine and estuarine ecology (6)

BIOL4301 Fish and fisheries (6)

Notes:

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Remarks:

Minor Title Minor in Marine Biology

Offered to students 2015

admitted to Year 1 in

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Learning Outcomes:

By the end of this programme, students should be able to:

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ENVS1301 Environmental life science (6)
BIOL2306 Ecology and evolution (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

BIOL3301 Marine biology (6)

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At least 12 credits selected from the following courses:

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BIOL3328 Nearshore marine and estuarine ecology (6)

BIOL4301 Fish and fisheries (6)

Notes:

Remarks:

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Minor Title Minor in Marine Biology

Offered to students 2014

admitted to Year 1 in

Objectives:

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1. Introductory level courses (12 credits)

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Disciplinary Core Courses (12 credits)

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Environmental oceanography (6) **FNVS3313**

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

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Nearshore marine and estuarine ecology (6) **BIOL3328**

Fish and fisheries (6) BIOL4301

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Remarks:

Minor Title Minor in Marine Biology

Offered to students 2013

admitted to Year 1 in

Objectives:

The field of marine biology has become increasingly popular as interest in and awareness of our marine environment grows. Hong Kong already has strong cultural and historical links with the sea as well as a strong economic and societal interest in natural marine resources. This Minor aims to introduce students to the field of marine biology from species, habitat and ecosystem levels, ranging from the deep ocean to intertidal environments, and from both theoretical and practical perspectives. Material will be global and include organisms and their physical, behavioral and physiological adaptations to the marine environment, as well as techniques for marine study, Major marine issues will be covered including benefits derived from the marine environment and possible implications of climate change for marine systems. Particularly relevant examples from Hong Kong and the Southeast Asia region will be highlighted. This minor will provide students from diverse backgrounds (e.g.business, engineering and social science) an excellent opportunity to enter into a career or research in marine environmentrelated fields such as coastal ecosystem management, fisheries, marine environmental protection, marine resource management, etc.

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Remarks:

Minor Title Minor in Marine Biology

Offered to students 2012

admitted to Year 1 in

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Impermissible Combinations:

NII

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1309 Evolutionary diversity (6)
ENVS1301 Environmental life science (6)
BIOL2306 Ecology and evolution (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

BIOL3301 Marine biology (6)

ENVS3313 Environmental oceanography (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL3303 Conservation biology (6)

BIOL3305 Tropical and temperate marine ecology field course (6)

BIOL3318 Experimental intertidal ecology (6)
BIOL3320 The biology of marine mammals (6)
BIOL3322 Marine invertebrate zoology (6)

BIOL3328 Nearshore marine and estuarine ecology (6)

BIOL4301 Fish and fisheries (6)

Notes

Remarks:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Minor Title Minor in Mathematics

Offered to students 2020

admitted to Year 1 in

Objectives:

The Minor in Mathematics provides students with fundamental knowledge in the subject. It is specifically designed for students who are interested in the subject and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe fundamental concepts of mathematics (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics. (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Minor in Computational & Financial Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (36 credits)

1. Introductory level courses (18 credits) (note 4)

Disciplinary Core Course (6 credits)

MATH1013 University mathematics II (6)

Disciplinary Electives (12 credits)

Select either List A or List B:

List A

MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)

List B

MATH2012 Fundamental concepts of mathematics (6)
MATH2014 Fundamental concepts of mathematics (6)
Multivariable calculus and linear algebra (6)

2. Advanced level courses (18 credits)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), subject to pre-requisite requirements. The current course list includes courses in List A:

List A

MATH3001 Development of mathematical ideas (6)

MATH3002 Mathematics seminar (6)

MATH3301 Algebra I (6)

MATH3303 Matrix theory and its applications (6)
MATH3304 Introduction to number theory (6)

MATH3401 Analysis I (6)

MATH3403 Functions of a complex variable (6)

MATH3405 Differential equations (6)

MATH3408 Computational methods and differential equations with

applications (6)

MATH3541 Introduction to topology (6) Discrete mathematics (6) MATH3600 MATH3601 Numerical analysis (6) Probability theory (6) MATH3603 Operations research I (6) MATH3901 Introduction to optimization (6) MATH3904 Queueing theory and simulation (6) **MATH3905** MATH3906 Financial calculus (6) MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6)
MATH3999 Directed studies in mathematics (6)

MATH4302 Algebra II (6)
MATH4402 Analysis II (6)
MATH4404 Functional analysis (6)

MATH4406 Introduction to partial differential equations (6)

MATH4501 Geometry (6)

MATH4511 Introduction to differentiable manifolds (6)

MATH4602 Scientific computing (6)
MATH4902 Operations research II (6)

MATH4907 Numerical methods for financial calculus (6)

MATH4910 Senior mathematics seminar (6)
MATH4911 Mathematics capstone project (6)
MATH4966 Mathematics internship (6)

MATH4999	Mathematics project (12)	
MATH7101	Intermediate complex analysis (6)	
MATH7201	Topics in geometry (6)	
MATH7202	Complex manifolds (6)	
MATH7217	Topics in financial mathematics (6)	
MATH7219	Topics in applied functional analysis (6)	
MATH7224	Topics in advanced probability theory (6)	
MATH7501	Topics in algebra (6)	
MATH7502	Topics in applied discrete mathematics (6)	
MATH7503	Topics in mathematical programming and optimization (6)	
MATH7504	Geometric topology (6)	
MATH7505	Real analysis (6)	

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- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. If students would like to take more courses in analysis such as MATH3401 (Analysis I), they are advised to take the introductory course MATH2241 Introduction to mathematical analysis first.
- 4. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks

Minor Title Minor in Mathematics

Offered to students 2019

admitted to Year 1 in

Objectives:

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Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Minor in Computational & Financial Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (36 credits)

1. Introductory level courses (18 credits) (note 4)

Disciplinary Core Course (6 credits)

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Disciplinary Electives (12 credits)

Select either List A or List B:

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Remarks

Minor Title Minor in Mathematics

Offered to students 2018

admitted to Year 1 in

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Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Minor in Computational & Financial Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (36 credits)

1. Introductory level courses (18 credits) (note 4)

Disciplinary Core Course (6 credits)

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Disciplinary Electives (12 credits)

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Remarks

Minor Title Minor in Mathematics

Offered to students 2017

admitted to Year 1 in

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Major in Mathematics (Intensive)

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Minor in Computational & Financial Mathematics

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Disciplinary Electives (12 credits)

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Analysis I (6)

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Differential equations (6) MATH3405

Computational methods and differential equations with MATH3408

applications (6) Introduction to topology (6)

MATH3541 MATH3600 Discrete mathematics (6) Numerical analysis (6) MATH3601 Probability theory (6) MATH3603 Operations research I (6) MATH3901 Introduction to optimization (6) MATH3904 MATH3905 Queueing theory and simulation (6)

MATH3906 Financial calculus (6) Game theory and strategy (6) MATH3911

Network models in operations research (6) MATH3943 MATH3999 Directed studies in mathematics (6)

MATH4302 Algebra II (6) Analysis II (6) MATH4402 Functional analysis (6) **MATH4404**

MATH4406 Introduction to partial differential equations (6)

Geometry (6) MATH4501

Introduction to differentiable manifolds (6) MATH4511

Scientific computing (6) MATH4602 MATH4902 Operations research II (6)

Numerical methods for financial calculus (6) MATH4907

Senior mathematics seminar (6) MATH4910 MATH4911 Mathematics capstone project (6)

MATH4966	Mathematics internship (6)	
MATH4999	Mathematics project (12)	
MATH7101	Intermediate complex analysis (6)	
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Remarks:

Minor Title Minor in Mathematics

Offered to students 2016

admitted to Year 1 in

Objectives:

The Minor in Mathematics provides students with fundamental knowledge in the subject. It is specifically designed for students who are interested in the subject and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems.

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Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Major in Mathematics/Physics

Minor in Computational & Financial Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (36 credits)

1. Introductory level courses (18 credits) (note 4)

Disciplinary Core Course (6 credits)

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Disciplinary Electives (12 credits)

Select either List A or List B:

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MATH2211 Multivariable calculus (6)

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MATH2014 Multivariable calculus and linear algebra (6)

2. Advanced level courses (18 credits)

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Remarks:

Minor Title Minor in Mathematics

Offered to students 2015

admitted to Year 1 in

Objectives:

The Minor in Mathematics provides students with fundamental knowledge in the subject. It is specifically designed for students who are interested in the subject and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems.

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Impermissible Combinations:

Major in Mathematics

Major in Mathematics/Physics

Minor in Computational & Financial Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (36 credits)

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- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. If students would like to take more courses in analysis such as MATH3401 (Analysis I), they are advised to take the introductory course MATH2241 Introduction to mathematical analysis first.
- 4. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks

Minor Title Minor in Mathematics

Offered to students 2014

admitted to Year 1 in

Objectives:

The Minor in Mathematics provides students with fundamental knowledge in the subject. It is specifically designed for students who are interested in the subject and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe fundamental concepts of mathematics (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics. (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics/Physics

Minor in Computational & Financial Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (36 credits)

1. Introductory level courses (18 credits) (note 4)

Disciplinary Core Courses (18 credits)

MATH1013 University mathematics II (6)
MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)

2. Advanced level courses (18 credits)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), subject to pre-requisite requirements. The current course list includes courses in List A:

List A

MATH3001 Development of mathematical ideas (6)

MATH3002 Mathematics seminar (6)

MATH3301 Algebra I (6)

MATH3303 Matrix theory and its applications (6) MATH3304 Introduction to number theory (6)

MATH3401 Analysis I (6)

MATH3403 Functions of a complex variable (6)

MATH3405 Differential equations (6)

MATH3408 Computational methods and differential equations with

applications (6)

MATH3541 Introduction to topology (6)
MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3603 Probability theory (6)
MATH3901 Operations research I (6)
MATH3904 Introduction to optimization (6)
MATH3905 Queueing theory and simulation (6)

MATH3906 Financial calculus (6)
MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6) MATH3999 Directed studies in mathematics (6)

MATH4302 Algebra II (6)
MATH4402 Analysis II (6)
MATH4404 Functional analysis (6)

MATH4406 Introduction to partial differential equations (6)

MATH4501 Geometry (6)

MATH4511 Introduction to differentiable manifolds (6)

MATH4602 Scientific computing (6)
MATH4902 Operations research II (6)

MATH4907 Numerical methods for financial calculus (6)

MATH4910 Senior mathematics seminar (6)
MATH4911 Mathematics capstone project (6)
MATH4966 Mathematics internship (6)
MATH4999 Mathematics project (12)
MATH7101 Intermediate complex analysis (6)

MATH7201 Topics in geometry (6) MATH7202 Complex manifolds (6)

MATH7217 Topics in financial mathematics (6)
MATH7219 Topics in applied functional analysis (6)

MATH7503 Topics in applied absolute mathematics (6) MATH7503 Topics in mathematical programming and optimization (6) MATH7504 Geometric topology (6) MATH7505 Real analysis (6)	MATH7505 Real analysis (6)		MATH7504	Geometric topology (6)
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Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. If students would like to take more courses in analysis such as MATH3401 (Analysis I), they are advised to take the introductory course MATH2241 Introduction to mathematical analysis first.
- 4. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Minor Title Minor in Mathematics

Offered to students 2013

admitted to Year 1 in

Objectives:

The Minor in Mathematics provides students with fundamental knowledge in the subject. It is specifically designed for students who are interested in the subject and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe fundamental concepts of mathematics (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics. (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics/Physics

Minor in Computational & Financial Mathematics

Minor in Operations Research & Mathematical Programming

Required courses (36 credits)

1. Introductory level courses (18 credits) (note 4)

Disciplinary Core Courses (18 credits)

MATH1013 University mathematics II (6)
MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)

2. Advanced level courses (18 credits)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), subject to pre-requisite requirements. The current course list includes courses in List A:

List A

MATH3001 Development of mathematical ideas (6)

MATH3002 Mathematics seminar (6)

MATH3301 Algebra I (6)

MATH3303 Matrix theory and its applications (6) MATH3304 Introduction to number theory (6)

MATH3401 Analysis I (6)

MATH3403 Functions of a complex variable (6)

MATH3405 Differential equations (6)

MATH3408 Computational methods and differential equations with

applications (6)

MATH3541 Introduction to topology (6)
MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3603 Probability theory (6)
MATH3901 Operations research I (6)
MATH3904 Introduction to optimization (6)
MATH3905 Queueing theory and simulation (6)

MATH3906 Financial calculus (6)
MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6) MATH3999 Directed studies in mathematics (6)

MATH4302 Algebra II (6)
MATH4402 Analysis II (6)
MATH4404 Functional analysis (6)

MATH4406 Introduction to partial differential equations (6)

MATH4501 Geometry (6)

MATH4511 Introduction to differentiable manifolds (6)

MATH4602 Scientific computing (6)
MATH4902 Operations research II (6)

MATH4907 Numerical methods for financial calculus (6)

MATH4910 Senior mathematics seminar (6)
MATH4911 Mathematics capstone project (6)
MATH4966 Mathematics internship (6)
MATH4999 Mathematics project (12)
MATH7101 Intermediate complex analysis (6)

MATH7201 Topics in geometry (6) MATH7202 Complex manifolds (6)

MATH7217 Topics in financial mathematics (6)
MATH7219 Topics in applied functional analysis (6)

MATH7224 MATH7501	Topics in advanced probability theory (6) Topics in algebra (6)
MATH7502	Topics in applied discrete mathematics (6)
MATH7503	Topics in mathematical programming and optimization (6)
MATH7504	Geometric topology (6)
MATH7505	Real analysis (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. If students would like to take more courses in analysis such as MATH3401 (Analysis I), they are advised to take the introductory course MATH2241 Introduction to mathematical analysis first.
- 4. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Minor Title Minor in Mathematics

Offered to students 2012

admitted to Year 1 in

Objectives:

The Minor in Mathematics provides students with fundamental knowledge in the subject. It is specifically designed for students who are interested in the subject and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving, and capability to tackle novel situations and ill-defined problems.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: understand and describe fundamental concepts of mathematics (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics. (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics/Physics

Minor in Computational & Financial Mathematics

Required courses (36 credits)

1. Introductory level courses (18 credits) (note 4)

Disciplinary Core Courses (18 credits)

MATH1013 University mathematics II (6)
MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)

2. Advanced level courses (18 credits)

Disciplinary Electives (18 credits)

At least 18 credits of advanced level Mathematics courses (MATH3XXX or MATH4XXX or MATH7XXX level), subject to pre-requisite requirements. The current course list includes courses in List A:

List A

MATH3001 Development of mathematical ideas (6)

MATH3002 Mathematics seminar (6)

MATH3301 Algebra I (6)

MATH3303 Matrix theory and its applications (6) MATH3304 Introduction to number theory (6)

MATH3401 Analysis I (6)

MATH3403 Functions of a complex variable (6)

MATH3405 Differential equations (6)

MATH3408 Computational methods and differential equations with

applications (6)
Introduction to topology (6)

MATH3541 Introduction to topology (6)
MATH3600 Discrete mathematics (6)
MATH3601 Numerical analysis (6)
MATH3603 Probability theory (6)
MATH3901 Operations research I (6)
MATH3904 Introduction to optimization (6)
MATH3905 Queueing theory and simulation (6)

MATH3906 Financial calculus (6)
MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6)
MATH3999 Directed studies in mathematics (6)

MATH4302 Algebra II (6)
MATH4402 Analysis II (6)
MATH4404 Functional analysis (6)

MATH4406 Introduction to partial differential equations (6)

MATH4501 Geometry (6)

MATH4511 Introduction to differentiable manifolds (6)

MATH4602 Scientific computing (6)
MATH4902 Operations research II (6)

MATH4907 Numerical methods for financial calculus (6)

MATH4910 Senior mathematics seminar (6)
MATH4911 Mathematics capstone project (6)
MATH4966 Mathematics internship (6)
MATH4999 Mathematics project (12)
MATH7101 Intermediate complex analysis (6)

MATH7201 Topics in geometry (6)
MATH7202 Complex manifolds (6)

MATH7217 Topics in financial mathematics (6)
MATH7219 Topics in applied functional analysis (6)
MATH7224 Topics in advanced probability theory (6)

MATH7501 MATH7502	Topics in algebra (6) Topics in applied discrete mathematics (6)
MATH7503	Topics in mathematical programming and optimization (6)
MATH7504	Geometric topology (6)
MATH7505	Real analysis (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this major. Students who do not fulfill this requirement are advised to take MATH1011 University mathematics I.
- 3. If students would like to take more courses in analysis such as MATH3401 (Analysis I), they are advised to take the introductory course MATH2241 Introduction to mathematical analysis first.
- 4. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks

Offered to students

2020

admitted to Year 1 in

Objectives:

The Minor in Molecular Biology & Biotechnology aims to provide students with a fundamental understanding of molecular biology and biotechnology which are relevant to many other disciplines of study and our daily life. Students will learn the principles underlying current molecular and cell biology advances, and biotechnological applications and will become literate in biotechnology business and advancements.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: develop and apply basic technical and knowledge-based skills in molecular and cell biology, and biotechnology (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: develop and apply skills of critical inquiry, teamwork, and effective communication (by means of group projects, tutorial classes and presentation opportunities in the curriculum)
- PLO 3: understand and describe the issues and concerns fundamental to the field (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Molecular Biology & Biotechnology

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOC2600 Basic biochemistry (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

BIOL2306 Ecology and evolution (6)

May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.

May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.

2. Advanced level courses (24 credits)

Disciplinary Core Courses (6 credits)

BIOL3401 Molecular biology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses: BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3409 Business aspects of biotechnology (6)
BIOL3508 Microbial physiology and biotechnology (6)
BIOL4401 Medical microbiology and applied immunology (6)

BIOL4411 Plant and food biotechnology (6)
BIOL4415 Healthcare biotechnology (6)
BIOL4416 Stem cells and regenerative biology (6)
BIOL4417 'Omics' and systems biology (6)
ENVS4110 Environmental remediation (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students

2019

admitted to Year 1 in

Objectives:

The Minor in Molecular Biology & Biotechnology aims to provide students with a fundamental understanding of molecular biology and biotechnology which are relevant to many other disciplines of study and our daily life. Students will learn the principles underlying current molecular and cell biology advances, and biotechnological applications and will become literate in biotechnology business and advancements.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: develop and apply basic technical and knowledge-based skills in molecular and cell biology, and biotechnology (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: develop and apply skills of critical inquiry, teamwork, and effective communication (by means of group projects, tutorial classes and presentation opportunities in the curriculum)
- PLO 3: understand and describe the issues and concerns fundamental to the field (by means of coursework and laboratorybased learning in the curriculum)

Impermissible Combinations:

Major in Molecular Biology & Biotechnology

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6) BIOL1309 Evolutionary diversity (6)

BIOC2600 Basic biochemistry (6) May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not

May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.

both. BIOL2220 and BIOC2600 are mutually

May take either BIOL2220 or BIOC2600 to

exclusive.

Biostatistics (6) **BIOL2102**

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

BIOL2306 Ecology and evolution (6)

May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.

2. Advanced level courses (24 credits) **Disciplinary Core Courses (6 credits)** BIOL3401 Molecular biology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

BIOL3402 Cell biology and cell technology (6) BIOL3403 Immunology (6)

Business aspects of biotechnology (6) **BIOL3409** BIOL3508 Microbial physiology and biotechnology (6) BIOL4401 Medical microbiology and applied immunology (6)

BIOL4411 Plant and food biotechnology (6) Healthcare biotechnology (6) **BIOL4415** Stem cells and regenerative biology (6) BIOL4416 'Omics' and systems biology (6) **BIOI 4417** ENVS4110 Environmental remediation (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students

2018

admitted to Year 1 in

Objectives:

The Minor in Molecular Biology & Biotechnology aims to provide students with a fundamental understanding of molecular biology and biotechnology which are relevant to many other disciplines of study and our daily life. Students will learn the principles underlying current molecular and cell biology advances, and biotechnological applications and will become literate in biotechnology business and advancements.

Learning Outcomes:

BIOL2102

By the end of this programme, students should be able to:

- PLO 1: develop and apply basic technical and knowledge-based skills in molecular and cell biology, and biotechnology (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: develop and apply skills of critical inquiry, teamwork, and effective communication (by means of group projects, tutorial classes and presentation opportunities in the curriculum)
- PLO 3: understand and describe the issues and concerns fundamental to the field (by means of coursework and laboratorybased learning in the curriculum)

Impermissible Combinations:

Major in Molecular Biology & Biotechnology

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6) BIOL1309 Evolutionary diversity (6)

Basic biochemistry (6) **BIOC2600**

Biostatistics (6) BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

BIOI 2306 Ecology and evolution (6)

fulfill this 12 credits requirement, but not both. May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

May take either BIOL1309 or BIOL2306 to

May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.

2. Advanced level courses (24 credits)

Disciplinary Core Courses (6 credits)

BIOL3401 Molecular biology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses: BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

Business aspects of biotechnology (6) **BIOL3409** BIOL3508 Microbial physiology and biotechnology (6) BIOL4401 Medical microbiology and applied immunology (6)

BIOL4411 Plant and food biotechnology (6) Healthcare biotechnology (6) **BIOL4415** Stem cells and regenerative biology (6) BIOL4416 'Omics' and systems biology (6) **BIOI 4417** ENVS4110 Environmental remediation (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

2017

Offered to students

admitted to Year 1 in

Objectives:

The Minor in Molecular Biology & Biotechnology aims to provide students with a fundamental understanding of molecular biology and biotechnology which are relevant to many other disciplines of study and our daily life. Students will learn the principles underlying current molecular and cell biology advances, and biotechnological applications and will become literate in biotechnology business and advancements.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: develop and apply basic technical and knowledge-based skills in molecular and cell biology, and biotechnology (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: develop and apply skills of critical inquiry, teamwork, and effective communication (by means of group projects, tutorial classes and presentation opportunities in the curriculum)
- PLO 3: understand and describe the issues and concerns fundamental to the field (by means of coursework and laboratory-based learning in the curriculum)

Impermissible Combinations:

Major in Molecular Biology & Biotechnology

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOC2600 Basic biochemistry (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

BIOL2306 Ecology and evolution (6)

fulfill this 12 credits requirement, but not both. May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

May take either BIOL1309 or BIOL2306 to

May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.

2. Advanced level courses (24 credits)

Disciplinary Core Courses (6 credits)

BIOL3401 Molecular biology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses: BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

BIOL3409 Business aspects of biotechnology (6)
BIOL3508 Microbial physiology and biotechnology (6)
BIOL4401 Medical microbiology and applied immunology (6)

BIOL4411 Plant and food biotechnology (6)
BIOL4415 Healthcare biotechnology (6)
BIOL4416 Stem cells and regenerative biology (6)
BIOL4417 'Omics' and systems biology (6)
ENVS4110 Environmental remediation (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students admitted to Year 1 in 2016

Objectives:

The Minor in Molecular Biology & Biotechnology aims to provide students with a fundamental understanding of molecular biology and biotechnology which are relevant to many other disciplines of study and our daily life. Students will learn the principles underlying current molecular and cell biology advances, and biotechnological applications and will become literate in biotechnology business and advancements.

Learning Outcomes:

BIOL2102

By the end of this programme, students should be able to:

- PLO 1: develop and apply basic technical and knowledge-based skills in molecular and cell biology, and biotechnology (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: develop and apply skills of critical inquiry, teamwork, and effective communication (by means of group projects, tutorial classes and presentation opportunities in the curriculum)
- PLO 3: understand and describe the issues and concerns fundamental to the field (by means of coursework and laboratorybased learning in the curriculum)

Impermissible Combinations:

Major in Molecular Biology & Biotechnology

Major in Molecular Biology & Biotechnology (Intensive)

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6) BIOL1309 Evolutionary diversity (6)

BIOC2600 Basic biochemistry (6)

Biostatistics (6) BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

BIOI 2306 Ecology and evolution (6)

May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both. May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.

May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.

2. Advanced level courses (24 credits)

Disciplinary Core Courses (6 credits)

BIOL3401 Molecular biology (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses: BIOL3402 Cell biology and cell technology (6)

BIOL3403 Immunology (6)

Business aspects of biotechnology (6) **BIOL3409** Microbial physiology and biotechnology (6) BIOL3508 BIOL4401 Medical microbiology and applied immunology (6)

BIOL4411 Plant and food biotechnology (6) Healthcare biotechnology (6) **BIOL4415** Stem cells and regenerative biology (6) BIOL4416 'Omics' and systems biology (6) **BIOI 4417** ENVS4110 Environmental remediation (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

2015

Offered to students

admitted to Year 1 in

Objectives:

The Minor in Molecular Biology & Biotechnology aims to provide students with a fundamental understanding of molecular biology and biotechnology which are relevant to many other disciplines of study and our daily life. Students will learn the principles underlying current molecular and cell biology advances, and biotechnological applications and will become literate in biotechnology business and advancements.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: develop and apply basic technical and knowledge-based skills in molecular and cell biology, and biotechnology (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: develop and apply skills of critical inquiry, teamwork, and effective communication (by means of group projects, tutorial classes and presentation opportunities in the curriculum)
- PLO 3: understand and describe the issues and concerns fundamental to the field (by means of coursework and laboratorybased learning in the curriculum)

Impermissible Combinations:

Major in Molecular Biology & Biotechnology

Major in Molecular Bio	ology & Biotechnology (Intensive)	
Required courses	s (36 credits)	
1. Introductory lev	el courses (12 credits)	
Disciplinary Elective	ves (12 credits)	
	ts selected from the following courses:	
BIOL1110	From molecules to cells (6)	
BIOL1309	Evolutionary diversity (6)	May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.
BIOC2600	Basic biochemistry (6)	May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.
BIOL2102	Biostatistics (6)	
BIOL2103	Biological sciences laboratory course (6)	
BIOL2220	Principles of biochemistry (6)	May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.
BIOL2306	Ecology and evolution (6)	May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.
2. Advanced level	courses (24 credits)	, ,
Disciplinary Core	Courses (6 credits)	
BIOL3401	Molecular biology (6)	
Disciplinary Elective		
II .	ts selected from the following courses:	
BIOL3402	Cell biology and cell technology (6)	
BIOL3403	Immunology (6)	
BIOL3409	Business aspects of biotechnology (6)	T '' DIOLOGO DIOL
BIOL3508	Microbial physiology and biotechnology (6)	Take either BIOL3508 or BIOL4402 to fulfill this 18 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.
BIOL4401	Medical microbiology and applied immunology (6)	
BIOL4402	Microbial biotechnology (6)	Take either BIOL3508 or BIOL4402 to fulfill this 18 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.
BIOL4411	Plant and food biotechnology (6)	
BIOL4415	Healthcare biotechnology (6)	
BIOL4416	Stem cells and regenerative biology (6)	
BIOL4417	'Omics' and systems biology (6)	
ENVS4110	Environmental remediation (6)	

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students

2014

admitted to Year 1 in

Objectives:

The Minor in Molecular Biology & Biotechnology aims to provide students with a fundamental understanding of molecular biology and biotechnology which are relevant to many other disciplines of study and our daily life. Students will learn the principles underlying current molecular and cell biology advances, and biotechnological applications and will become literate in biotechnology business and advancements.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: develop and apply basic technical and knowledge-based skills in molecular and cell biology, and biotechnology (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: develop and apply skills of critical inquiry, teamwork, and effective communication (by means of group projects, tutorial classes and presentation opportunities in the curriculum)
- PLO 3: understand and describe the issues and concerns fundamental to the field (by means of coursework and laboratorybased learning in the curriculum)

Impermissible Combinations:

Major in Molecular Biology & Biotechnology

Major in Molecular Biol	logy & Biotechnology (Intensive)	
Required courses	(36 credits)	
	el courses (12 credits)	
Disciplinary Electiv	•	
BIOL1110	s selected from the following courses: From molecules to cells (6)	
BIOL110	Evolutionary diversity (6)	May take either BIOL1309 or BIOL2306 to
DIOL 1309	Evolutionary diversity (o)	fulfill this 12 credits requirement, but not both.
BIOC2600	Basic biochemistry (6)	May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.
BIOL2102	Biostatistics (6)	
BIOL2103	Biological sciences laboratory course (6)	
BIOL2220	Principles of biochemistry (6)	May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.
BIOL2306	Ecology and evolution (6)	May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.
2. Advanced level of	courses (24 credits)	,
Disciplinary Core C	Courses (6 credits)	
BIOL3401	Molecular biology (6)	
Disciplinary Elective	ves (18 credits)	
	s selected from the following courses:	
BIOL3402	Cell biology and cell technology (6)	
BIOL3403	Immunology (6)	
BIOL3409	Business aspects of biotechnology (6)	
BIOL3508	Microbial physiology and biotechnology (6)	Take either BIOL3508 or BIOL4402 to fulfill this 18 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.
BIOL4401	Medical microbiology and applied immunology (6)	
BIOL4402	Microbial biotechnology (6)	Take either BIOL3508 or BIOL4402 to fulfill this 18 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.
BIOL4411	Plant and food biotechnology (6)	
BIOL4415	Healthcare biotechnology (6)	
BIOL4416	Stem cells and regenerative biology (6)	
BIOL4417	'Omics' and systems biology (6)	
ENVS4110	Environmental remediation (6)	

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students

2013

admitted to Year 1 in

Objectives:

The Minor in Molecular Biology & Biotechnology aims to provide students with a fundamental understanding of molecular biology and biotechnology which are relevant to many other disciplines of study and our daily life. Students will learn the principles underlying current molecular and cell biology advances, and biotechnological applications and will become literate in biotechnology business and advancements.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: develop and apply basic technical and knowledge-based skills in molecular and cell biology, and biotechnology (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: develop and apply skills of critical inquiry, teamwork, and effective communication (by means of group projects, tutorial classes and presentation opportunities in the curriculum)
- PLO 3: understand and describe the issues and concerns fundamental to the field (by means of coursework and laboratorybased learning in the curriculum)

Impermissible Combinations:

Major in Molecular Biology & Biotechnology

Required courses (36 credits) 1. Introductory level courses (12 credits) Disciplinary Electives (12 credits selected from the following courses: BIOL1310 BIOL2600 Basic biochemistry (6) BIOL2102 Biostalistics (6) BIOL2103 Biological sciences laboratory course (6) BIOL2220 Biological sciences laboratory course (6) BIOL2306 BIOL2306 BIOL2306 Biological sciences laboratory course (6) BIOL2306 BIOL2306 BIOL2306 BIOL3401 BIOL3401 BIOL3401 Molecular biology (6) BIOL3402 BIOL3403 BIOL3403 BIOL3403 BIOL3404 BIOL3508 BIOL3404 BIOL3508 BIOL3401 Molecular biology (6) BIOL3403 BIOL3409 Biological sciences of biotechnology (6) BIOL3508 BIOL3401 Molecular biology and evolution (7) BIOL3508 BIOL3508 Microbial physiology and biotechnology (6) BIOL3508 BIOL3401 BIOL3508 Microbial physiology and applied immunology (6) BIOL3508 BIOL3401 BIOL4401 BIOL4401 Medical microbiology and applied immunology (6) BIOL4411 BIOL4415 BIOL4415 BIOL4415 BIOL4416 Stem cells and regenerative biology (6) BIOL4417 Omics' and systems biology (6) BIOL4417 ENVSAH10 Environmental remediation (6)	Major in Molecular Bio	ology & Biotechnology (Intensive)	
Disciplinary Electives (12 credits) At least 12 credits selected from the following courses: BIOL1110 From molecules to cells (6) BIOL1309 Evolutionary diversity (6) BIOC2600 Basic biochemistry (6) BIOC2600 Basic biochemistry (6) BIOL2102 Biostatistics (6) BIOL2103 Biological sciences laboratory course (6) BIOL2200 Principles of biochemistry (6) BIOL2220 Principles of biochemistry (6) BIOL2220 Principles of biochemistry (6) BIOL2306 Ecology and evolution (6) BIOL2306 Ecology and evolution (6) BIOL3401 Molecular biology (6) BIOL3401 Molecular biology (6) BIOL3402 Cell biology and cell technology (6) BIOL3403 Biologida sas spects of biotechnology (6) BIOL3508 Microbial physiology and applied immunology (6) BIOL3508 Microbial biotechnology (6) BIOL3400 Microbial biotechnology (6) BIOL3401 Medical microbiology and applied immunology (6) BIOL3402 Microbial biotechnology (6) BIOL3403 Microbial biotechnology (6) BIOL3404 Medical microbiology and applied immunology (6) BIOL3401 Medical microbiology and applied immunology (6) BIOL3402 Microbial biotechnology (6) BIOL3403 Microbial biotechnology (6) BIOL3404 Microbial biotechnology (6) BIOL3404 Microbial biotechnology (6) BIOL3401 Medical microbiology and applied immunology (6) BIOL3402 Microbial biotechnology (6) BIOL3403 Microbial biotechnology (6) BIOL3404 Microbial biotechnology (6) BIOL3404 Microbial biotechnology (6) BIOL3404 Microbial biotechnology (6) BIOL3404 Microbial biotechnology (6) BIOL3404 Microbial biotechnology (6) BIOL3411 Plant and food biotechnology (6) BIOL3415 Healthcare biotechnology (6) BIOL3416 Stem cells and regenerative biology (6) BIOL3417 Omics' and systems biology (6)	Required courses	s (36 credits)	
At least 12 credits selected from the following courses: BIOL1110 From molecules to cells (6) BIOL1309 Evolutionary diversity (6) BIOC2600 Basic biochemistry (6) BIOC2600 Basic biochemistry (6) BIOL2102 Biostatistics (6) BIOL2103 Biological sciences laboratory course (6) BIOL2220 Principles of biochemistry (6) BIOL2220 Principles of biochemistry (6) BIOL2200 Principles of biochemistry (6) BIOL2306 Ecology and evolution (6) 2. Advanced level courses (24 credits) BIOL3401 Molecular biology (6) BIOL3401 Molecular biology (6) BIOL3402 Cell biology and ellechnology (6) BIOL3508 Microbial physiology and biotechnology (6) BIOL3508 Microbial biotechnology (6) BIOL3508 Microbial biotechnology (6) BIOL4401 Medical microbiology and applied immunology (6) BIOL3402 Microbial biotechnology (6) BIOL3403 Microbial biotechnology (6) BIOL3404 Medical microbiology and applied immunology (6) BIOL3508 Microbial biotechnology (6) BIOL3401 Plant and food biotechnology (6) BIOL3402 Microbial biotechnology (6) BIOL3403 Microbial biotechnology (6) BIOL3508 and BIOL3508 or BIOL4402 are mutually exclusive. BIOL4401 Plant and food biotechnology (6) BIOL3508 and BIOL3508 or BIOL4402 are mutually exclusive. BIOL4401 Plant and food biotechnology (6) BIOL3401 Plant and food biotechnology (6) BIOL3402 Microbial biotechnology (6) BIOL3403 Microbial biotechnology (6) BIOL3404 Microbial biotechnology (6) BIOL3405 Biol3308 Microbial biotechnology (6) BIOL3406 Microbial biotechnology (6) BIOL3407 Microbial biotechnology (6) BIOL3408 Microbial biotechnology (6) BIOL3411 Plant and food biotechnology (6) BIOL3415 Healthcare biotechnology (6) BIOL3416 Stem cells and regenerative biology (6) BIOL3417 Omics' and systems biology (6)			
BIOL1110 From molecules to cells (6) BIOL1309 Evolutionary diversity (6) BIOC2600 Basic biochemistry (6) BIOC2600 Basic biochemistry (6) BIOL2102 Biostatistics (6) BIOL2103 Biological sciences laboratory course (6) BIOL2220 Principles of biochemistry (6) BIOL2306 Ecology and evolution (6) 2. Advanced level courses (24 credits) BIOL3401 Molecular biology (6) BIOL3402 Cell biology and cell technology (6) BIOL3402 Biological sciences appeared biochemistry (6) BIOL3401 Molecular biology (6) BIOL3402 Cell biology and dell technology (6) BIOL3409 Bioloston Microbial physiology and biotechnology (6) BIOL3401 Medical microbiology and applied immunology (6) BIOL3401 Medical microbiology and applied immunology (6) BIOL3401 Medical microbiology (6) BIOL3402 Microbial biotechnology (6) BIOL3508 Microbial physiology and applied immunology (6) BIOL3508 Microbial biotechnology (6) BIOL3401 Plant and food biotechnology (6) BIOL3401 Medical microbiology (6) BIOL3401 Medical microbiology (6) BIOL3402 Microbial biotechnology (6) BIOL3508 Microbial biotechnology (6) BIOL3508 Microbial biotechnology (6) BIOL3508 and BIOL3508 or BIOL3602 or BIOL3602 or BIOL3603 or BIO			
BIOL309 Evolutionary diversity (6) BiOC2600 Basic biochemistry (6) BiOC2600 Basic biochemistry (6) BiOC2600 Basic biochemistry (6) BiOL2102 Biostatistics (6) BiOL2103 Biological sciences laboratory course (6) BIOL2220 Principles of biochemistry (6) BiOL2220 Principles of biochemistry (6) BiOL2306 Ecology and evolution (6) 2. Advanced level courses (24 credits) Disciplinary Core Courses (6 credits) BiOL3401 Molecular biology (6) BiOL3402 Cell biology and cell technology (6) BiOL3403 Biological sciences aboratory courses: BiOL3402 Cell biology and cell technology (6) BiOL3508 Microbial physiology and biotechnology (6) BiOL4401 Medical microbiology and applied immunology (6) BiOL4401 Medical microbiology and applied immunology (6) BiOL4411 Plant and food biotechnology (6) BiOL4411 Plant and food biotechnology (6) BiOL4411 Plant and food biotechnology (6) BiOL4415 Stem cells and regenerative biology (6) BiOL44416 Stem cells and regenerative biology (6) BiOL44417 'Omics' and systems biology (6)			
BIOC2600 Basic biochemistry (6) BIOC2600 Basic biochemistry (6) BIOC2600 Basic biochemistry (6) BIOC2102 Biostatistics (6) BIOC2103 Biological sciences laboratory course (6) BIOC220 Principles of biochemistry (6) BIOC220 Principles of biochemistry (6) BIOC220 Principles of biochemistry (6) BIOC220 BIOC2600 are mutually exclusive. BIOC220 CEL biology and evolution (6) 2. Advanced level courses (24 credits) BIOC3401 Molecular biology (6) Disciplinary Core Courses (6 credits) BIOC3402 Cell biology and cell technology (6) BIOC3403 Immunology (6) BIOC3409 Business aspects of biotechnology (6) BIOC3508 Microbial physiology and biotechnology (6) BIOC3401 Medical microbiology and applied immunology (6) BIOC3508 Microbial biotechnology (6) BIOC3401 Medical microbiology and applied immunology (6) BIOC3508 Microbial biotechnology (6) BIOC3508 And BIOC3508 or		` '	
BIOL2102 Biostatistics (6) BIOL2103 Biological sciences laboratory course (6) BIOL2220 Principles of biochemistry (6) BIOL220 Principles of biochemistry (6) BIOL2306 Ecology and evolution (6) 2. Advanced level courses (24 credits) BIOL3401 Molecular biology (6) Disciplinary Crec Courses (6 credits) BIOL3402 Cell biology and ell technology (6) BIOL3403 Biology and ell technology (6) BIOL3409 Business aspects of biotechnology (6) BIOL3508 Microbial physiology and applied immunology (6) BIOL4401 Medical microbiology and applied immunology (6) BIOL4401 Microbial biotechnology (6) BIOL4401 Plant and food biotechnology (6) BIOL4411 Stem cells and regenerative biology (6) BIOL4415 Stem cells and regenerative biology (6) BIOL4417 Omics' and systems biology (6)		, , ,	fulfill this 12 credits requirement, but not both.
BIOL 2103 Biological sciences laboratory course (6) BIOL 2220 Principles of biochemistry (6) BIOL 2220 Principles of biochemistry (6) BIOL 2306 Ecology and evolution (6) 2. Advanced level courses (24 credits) Disciplinary Core Courses (6 credits) BIOL 3401 Molecular biology (6) Disciplinary Electives (18 credits) At least 18 credits selected from the following courses: BIOL 3402 Cell biology and cell technology (6) BIOL 3409 Business aspects of biotechnology (6) BIOL 3508 Microbial physiology and biotechnology (6) BIOL 4401 Medical microbiology and applied immunology (6) BIOL 4402 Microbial biotechnology (6) BIOL 4401 Medical microbiology and applied immunology (6) BIOL 4402 Microbial biotechnology (6) BIOL 4401 Plant and food biotechnology (6) BIOL 4402 Microbial biotechnology (6) BIOL 4411 Plant and food biotechnology (6) BIOL 4415 Healthcare biotechnology (6) BIOL 4416 Stem cells and regenerative biology (6) BIOL 4417 'Omics' and systems biology (6)	BIOC2600	Basic biochemistry (6)	fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually
BIOL 2220 Principles of biochemistry (6) BIOL 2306 Ecology and evolution (6) BIOL 2306 Ecology and evolution (6) 2. Advanced level courses (24 credits) Disciplinary Core Courses (6 credits) BIOL 3401 Molecular biology (6) Disciplinary Electives (18 credits) BIOL 3402 Cell biology and cell technology (6) BIOL 3409 Business aspects of biotechnology (6) BIOL 3508 Microbial physiology and biotechnology (6) BIOL 3508 Microbial biotechnology (6) BIOL 4401 Medical microbiology and applied immunology (6) BIOL 4402 Microbial biotechnology (6) BIOL 4401 Medical microbiology and applied immunology (6) BIOL 4402 Microbial biotechnology (6) BIOL 4402 Microbial biotechnology (6) BIOL 4411 Plant and food biotechnology (6) BIOL 4415 Healthcare biotechnology (6) BIOL 4415 Healthcare biotechnology (6) BIOL 4417 'Omics' and systems biology (6)	BIOL2102	Biostatistics (6)	
BIOL 2220 Principles of biochemistry (6) BIOL 2306 Ecology and evolution (6) BIOL 2306 Ecology and evolution (6) 2. Advanced level courses (24 credits) Disciplinary Core Courses (6 credits) BIOL 3401 Molecular biology (6) Disciplinary Electives (18 credits) BIOL 3402 Cell biology and cell technology (6) BIOL 3409 Business aspects of biotechnology (6) BIOL 3508 Microbial physiology and biotechnology (6) BIOL 3508 Microbial biotechnology (6) BIOL 4401 Medical microbiology and applied immunology (6) BIOL 4402 Microbial biotechnology (6) BIOL 4401 Medical microbiology and applied immunology (6) BIOL 4402 Microbial biotechnology (6) BIOL 4402 Microbial biotechnology (6) BIOL 4411 Plant and food biotechnology (6) BIOL 4415 Healthcare biotechnology (6) BIOL 4415 Healthcare biotechnology (6) BIOL 4417 'Omics' and systems biology (6)	BIOL2103	Biological sciences laboratory course (6)	
BIOL2306 Ecology and evolution (6) 2. Advanced level courses (24 credits) Disciplinary Core Courses (6 credits) BIOL3401 Molecular biology (6) Disciplinary Electives (18 credits) At least 18 credits selected from the following courses: BIOL3402 Cell biology and cell technology (6) BIOL3409 Business aspects of biotechnology (6) BIOL3508 Microbial physiology and biotechnology (6) BIOL4401 Medical microbiology and applied immunology (6) BIOL4402 Microbial biotechnology (6) BIOL4411 Plant and food biotechnology (6) BIOL4415 Healthcare biotechnology (6) BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6) BIOL4417 'Omics' and systems biology (6) BIOL4417 'Omics' and systems biology (6) BIOL4417 'Omics' and systems biology (6) BIOL4417 'Omics' and systems biology (6) BIOL4417 'Omics' and systems biology (6)	BIOL2220		fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually
2. Advanced level courses (24 credits) Disciplinary Core Courses (6 credits) BIOL 3401 Molecular biology (6) Disciplinary Electives (18 credits) At least 18 credits selected from the following courses: BIOL 3402 Cell biology and cell technology (6) BIOL 3409 Business aspects of biotechnology (6) BIOL 3508 Microbial physiology and biotechnology (6) BIOL 4401 Medical microbiology and applied immunology (6) BIOL 4402 Microbial biotechnology (6) BIOL 4401 Plant and food biotechnology (6) BIOL 4411 Plant and food biotechnology (6) BIOL 4415 Healthcare biotechnology (6) BIOL 4416 Stem cells and regenerative biology (6) BIOL 4417 'Omics' and systems biology (6)	BIOL2306	Ecology and evolution (6)	May take either BIOL1309 or BIOL2306 to
BIOL3401 Molecular biology (6) Disciplinary Electives (18 credits) At least 18 credits selected from the following courses: BIOL3402 Cell biology and cell technology (6) BIOL3409 Business aspects of biotechnology (6) BIOL3508 Microbial physiology and biotechnology (6) BIOL4401 Medical microbiology and applied immunology (6) BIOL4402 Microbial biotechnology (6) BIOL4411 Plant and food biotechnology (6) BIOL4415 Healthcare biotechnology (6) BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6)	2. Advanced level	courses (24 credits)	
BIOL3401 Molecular biology (6) Disciplinary Electives (18 credits) At least 18 credits selected from the following courses: BIOL3402 Cell biology and cell technology (6) BIOL3409 Business aspects of biotechnology (6) BIOL3508 Microbial physiology and biotechnology (6) BIOL4401 Medical microbiology and applied immunology (6) BIOL4402 Microbial biotechnology (6) BIOL4411 Plant and food biotechnology (6) BIOL4415 Healthcare biotechnology (6) BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6)	Disciplinary Core	Courses (6 credits)	
At least 18 credits selected from the following courses: BIOL3402			
BIOL3402 Cell biology and cell technology (6) BIOL3403 Immunology (6) BIOL3409 Business aspects of biotechnology (6) BIOL3508 Microbial physiology and biotechnology (6) BIOL4401 Medical microbiology and applied immunology (6) BIOL4402 Microbial biotechnology (6) BIOL4411 Plant and food biotechnology (6) BIOL4415 Healthcare biotechnology (6) BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6) BIOL4417 Cell biology (6) Take either BIOL3508 or BIOL4402 to fulfill this 18 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.	Disciplinary Electi	ves (18 credits)	
BIOL3403 Immunology (6) BIOL3409 Business aspects of biotechnology (6) BIOL3508 Microbial physiology and biotechnology (6) BIOL4401 Medical microbiology and applied immunology (6) BIOL4402 Microbial biotechnology (6) BIOL4411 Plant and food biotechnology (6) BIOL4415 Healthcare biotechnology (6) BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6)	At least 18 credit	ts selected from the following courses:	
BIOL3409 BIOL3508 Business aspects of biotechnology (6) BIOL3508 Microbial physiology and biotechnology (6) BIOL4401 BIOL4402 Medical microbiology and applied immunology (6) BIOL4402 Microbial biotechnology (6) BIOL4411 Plant and food biotechnology (6) BIOL4415 BIOL4416 BIOL4417 BUSINESS Aspects of biotechnology (6) Take either BIOL3508 or BIOL4402 are mutually exclusive. Take either BIOL3508 or BIOL4402 are mutually exclusive. Take either BIOL3508 or BIOL4402 are mutually exclusive. BIOL4411 Plant and food biotechnology (6) BIOL4415 BIOL4416 Stem cells and regenerative biology (6) Toke either BIOL3508 or BIOL4402 are mutually exclusive. Take either BIOL3508 or BIOL4402 are mutually exclusive.	BIOL3402	Cell biology and cell technology (6)	
BIOL3508 Microbial physiology and biotechnology (6) BIOL4401 Medical microbiology and applied immunology (6) BIOL4402 Microbial biotechnology (6) BIOL4411 Plant and food biotechnology (6) BIOL4415 Healthcare biotechnology (6) BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6) Take either BIOL3508 or BIOL4402 are mutually exclusive. Take either BIOL3508 or BIOL4402 to fulfill this 18 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.	BIOL3403	37 ()	
this 18 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive. BIOL4401 Medical microbiology and applied immunology (6) BIOL4402 Microbial biotechnology (6) BIOL4411 Plant and food biotechnology (6) BIOL4415 Healthcare biotechnology (6) BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6)	BIOL3409	1 0, ()	
BIOL4402 Microbial biotechnology (6) Take either BIOL3508 or BIOL4402 to fulfill this 18 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive. BIOL4411 Plant and food biotechnology (6) BIOL4415 Healthcare biotechnology (6) BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6)	BIOL3508	Microbial physiology and biotechnology (6)	this 18 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually
this 18 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive. BIOL4411 Plant and food biotechnology (6) BIOL4415 Healthcare biotechnology (6) BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6)	BIOL4401	Medical microbiology and applied immunology (6)	
BIOL4415 Healthcare biotechnology (6) BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6)	BIOL4402	Microbial biotechnology (6)	this 18 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually
BIOL4416 Stem cells and regenerative biology (6) BIOL4417 'Omics' and systems biology (6)	BIOL4411	Plant and food biotechnology (6)	
BIOL4417 'Omics' and systems biology (6)	BIOL4415	Healthcare biotechnology (6)	
=:==::::		Stem cells and regenerative biology (6)	
· · · · · · · · · · · · · · · · · · ·	BIOL4417	'Omics' and systems biology (6)	
	1	Environmental remediation (6)	

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students

2012 admitted to Year 1 in

Objectives:

The Minor in Molecular Biology & Biotechnology aims to provide students with a fundamental understanding of molecular biology and biotechnology which are relevant to many other disciplines of study and our daily life. Students will learn the principles underlying current molecular and cell biology advances, and biotechnological applications and will become literate in biotechnology business and advancements.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: develop and apply basic technical and knowledge-based skills in molecular and cell biology, and biotechnology (by means of coursework and laboratory-based learning in the curriculum)
- PLO 2: develop and apply skills of critical inquiry, teamwork, and effective communication (by means of group projects, tutorial classes and presentation opportunities in the curriculum)
- PLO 3: understand and describe the issues and concerns fundamental to the field (by means of coursework and laboratorybased learning in the curriculum)

Impermissible Combinations:

Major in Molecular Biology & Biotechnology

Major in Molecular Biol	logy & Biotechnology (Intensive)	
Required courses	(36 credits)	
	el courses (12 credits)	
Disciplinary Electiv	•	
BIOL1110	s selected from the following courses: From molecules to cells (6)	
BIOL110	Evolutionary diversity (6)	May take either BIOL1309 or BIOL2306 to
DIOL 1309	Evolutionary diversity (o)	fulfill this 12 credits requirement, but not both.
BIOC2600	Basic biochemistry (6)	May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.
BIOL2102	Biostatistics (6)	
BIOL2103	Biological sciences laboratory course (6)	
BIOL2220	Principles of biochemistry (6)	May take either BIOL2220 or BIOC2600 to fulfill this 12 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually exclusive.
BIOL2306	Ecology and evolution (6)	May take either BIOL1309 or BIOL2306 to fulfill this 12 credits requirement, but not both.
2. Advanced level of	courses (24 credits)	,
Disciplinary Core C	Courses (6 credits)	
BIOL3401	Molecular biology (6)	
Disciplinary Elective	ves (18 credits)	
	s selected from the following courses:	
BIOL3402	Cell biology and cell technology (6)	
BIOL3403	Immunology (6)	
BIOL3409	Business aspects of biotechnology (6)	
BIOL3508	Microbial physiology and biotechnology (6)	Take either BIOL3508 or BIOL4402 to fulfill this 18 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.
BIOL4401	Medical microbiology and applied immunology (6)	
BIOL4402	Microbial biotechnology (6)	Take either BIOL3508 or BIOL4402 to fulfill this 18 credits requirement, but not both. BIOL3508 and BIOL4402 are mutually exclusive.
BIOL4411	Plant and food biotechnology (6)	
BIOL4415	Healthcare biotechnology (6)	
BIOL4416	Stem cells and regenerative biology (6)	
BIOL4417	'Omics' and systems biology (6)	
ENVS4110	Environmental remediation (6)	

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students

admitted to Year 1 in

Objectives:

The Minor in Operations Research & Mathematical Programming provides students with fundamental knowledge in optimization, computational algorithm, mathematical modeling, and decision making. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from decision sciences and logistic industry.

Learning Outcomes:

By the end of this programme, students should be able to:

2020

- PLO 1: describe and demonstrate understanding of fundamental concepts in operations research & mathematical programming (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Minor in Mathematics

Minor in Computational & Financial Mathematics

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Course (6 credits)

MATH1013 University mathematics II (6)

Disciplinary Electives (12 credits)

Select either List A or List B:

List A

MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)

List B

MATH2012 Fundamental concepts of mathematics (6)
MATH2014 Multivariable calculus and linear algebra (6)

2. Advanced level courses (24 credits) Disciplinary Core Courses (12 credits)

MATH3901 Operations research I (6)
MATH3904 Introduction to optimization (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3405 Differential equations (6) MATH3600 Discrete mathematics (6)

MATH 1995 Queueing theory and simulation (6)

MATH3906 Financial calculus (6)
MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6)
MATH4902 Operations research II (6)
MATH4907 Numerical methods for financial calculus (6)

MATH7502 Topics in applied discrete mathematics (6)

MATH7503 Topics in mathematical programming and optimization (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this minor. Students who do not fulfill this requirement are required to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Offered to students

admitted to Year 1 in

Objectives:

The Minor in Operations Research & Mathematical Programming provides students with fundamental knowledge in optimization, computational algorithm, mathematical modeling, and decision making. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from decision sciences and logistic industry.

Learning Outcomes:

By the end of this programme, students should be able to:

2019

- PLO 1: describe and demonstrate understanding of fundamental concepts in operations research & mathematical programming (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and projectbased learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Minor in Mathematics

Minor in Computational & Financial Mathematics

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Course (6 credits)

University mathematics II (6) MATH1013

Disciplinary Electives (12 credits)

Select either List A or List B:

I ist A

MATH2101 Linear algebra I (6) Multivariable calculus (6) MATH2211

List B MATH2012 Fundamental concepts of mathematics (6) MATH2014 Multivariable calculus and linear algebra (6)

2. Advanced level courses (24 credits) **Disciplinary Core Courses (12 credits)**

Operations research I (6) MATH3901 MATH3904 Introduction to optimization (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3405 Differential equations (6) Discrete mathematics (6) MATH3600

MATH3905 Queueing theory and simulation (6)

Financial calculus (6) **MATH3906** Game theory and strategy (6) MATH3911

Network models in operations research (6) MATH3943 Operations research II (6) MATH4902

MATH4907 Numerical methods for financial calculus (6) MATH7502 Topics in applied discrete mathematics (6)

MATH7503 Topics in mathematical programming and optimization (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this minor. Students who do not fulfill this requirement are required to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Offered to students

admitted to Year 1 in

Objectives:

The Minor in Operations Research & Mathematical Programming provides students with fundamental knowledge in optimization, computational algorithm, mathematical modeling, and decision making. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from decision sciences and logistic industry.

Learning Outcomes:

By the end of this programme, students should be able to:

2018

- PLO 1: describe and demonstrate understanding of fundamental concepts in operations research & mathematical programming (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and projectbased learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Minor in Mathematics

Minor in Computational & Financial Mathematics

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Course (6 credits)

University mathematics II (6) MATH1013

Disciplinary Electives (12 credits)

Select either List A or List B:

I ist A

MATH2101 Linear algebra I (6) Multivariable calculus (6) MATH2211

List B MATH2012 Fundamental concepts of mathematics (6) MATH2014 Multivariable calculus and linear algebra (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits) Operations research I (6) MATH3901

MATH3904 Introduction to optimization (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3405 Differential equations (6) Discrete mathematics (6) MATH3600

MATH3905 Queueing theory and simulation (6)

Financial calculus (6) **MATH3906** Game theory and strategy (6) MATH3911

Network models in operations research (6) MATH3943 Operations research II (6) MATH4902 MATH4907 Numerical methods for financial calculus (6)

MATH7502 Topics in applied discrete mathematics (6)

MATH7503 Topics in mathematical programming and optimization (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this minor. Students who do not fulfill this requirement are required to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Offered to students 2017

admitted to Year 1 in

Objectives:

The Minor in Operations Research & Mathematical Programming provides students with fundamental knowledge in optimization, computational algorithm, mathematical modeling, and decision making. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from decision sciences and logistic industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and demonstrate understanding of fundamental concepts in operations research & mathematical programming (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and projectbased learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Major in Mathematics/Physics

Minor in Mathematics

Minor in Computational & Financial Mathematics

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Course (6 credits)

University mathematics II (6) MATH1013

Disciplinary Electives (12 credits)

Select either List A or List B:

List A

MATH2101 Linear algebra I (6) Multivariable calculus (6) MATH2211

List B

MATH2012 Fundamental concepts of mathematics (6) Multivariable calculus and linear algebra (6) MATH2014

2. Advanced level courses (24 credits) **Disciplinary Core Courses (12 credits)**

MATH3901 Operations research I (6) Introduction to optimization (6) MATH3904

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

Differential equations (6) MATH3405 Discrete mathematics (6) MATH3600

MATH3905 Queueing theory and simulation (6)

Financial calculus (6) MATH3906

MATH3911 Game theory and strategy (6)

Network models in operations research (6) MATH3943

MATH4902 Operations research II (6)

MATH4907 Numerical methods for financial calculus (6) MATH7502 Topics in applied discrete mathematics (6)

MATH7503 Topics in mathematical programming and optimization (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this minor. Students who do not fulfill this requirement are required to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Offered to students 2016

admitted to Year 1 in

Objectives:

The Minor in Operations Research & Mathematical Programming provides students with fundamental knowledge in optimization, computational algorithm, mathematical modeling, and decision making. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from decision sciences and logistic industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and demonstrate understanding of fundamental concepts in operations research & mathematical programming (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics (Intensive)

Major in Mathematics/Physics

Minor in Mathematics

Minor in Computational & Financial Mathematics

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Course (6 credits)

MATH1013 University mathematics II (6)

Disciplinary Electives (12 credits)

Select either List A or List B:

List A

MATH2101 Linear algebra I (6) MATH2211 Multivariable calculus (6)

List B

MATH2012 Fundamental concepts of mathematics (6)
MATH2014 Multivariable calculus and linear algebra (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

MATH3901 Operations research I (6)
MATH3904 Introduction to optimization (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3405 Differential equations (6) MATH3600 Discrete mathematics (6)

MATH3905 Queueing theory and simulation (6)

MATH3906 Financial calculus (6)

MATH3911 Game theory and strategy (6)

MATH4003

Network models in operations research (6)

Operations research II (6)

MATH4902 Operations research II (6)

MATH4907 Numerical methods for financial calculus (6) MATH7502 Topics in applied discrete mathematics (6)

MATH7503 Topics in mathematical programming and optimization (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this minor. Students who do not fulfill this requirement are required to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Offered to students 2015

admitted to Year 1 in

Objectives:

The Minor in Operations Research & Mathematical Programming provides students with fundamental knowledge in optimization, computational algorithm, mathematical modeling, and decision making. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from decision sciences and logistic industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and demonstrate understanding of fundamental concepts in operations research & mathematical programming (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and projectbased learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics/Physics

Minor in Mathematics

Minor in Computational & Financial Mathematics

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Course (6 credits)

University mathematics II (6) MATH1013

Disciplinary Electives (12 credits)

Select either List A or List B:

I ist A

MATH2101 Linear algebra I (6) Multivariable calculus (6) MATH2211

List B MATH2012 Fundamental concepts of mathematics (6)

MATH2014 Multivariable calculus and linear algebra (6)

2. Advanced level courses (24 credits) **Disciplinary Core Courses (12 credits)**

Operations research I (6) MATH3901 MATH3904 Introduction to optimization (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3405 Differential equations (6) Discrete mathematics (6) MATH3600

MATH3905 Queueing theory and simulation (6)

Financial calculus (6) **MATH3906** Game theory and strategy (6) MATH3911

Network models in operations research (6) MATH3943 Operations research II (6) MATH4902 MATH4907 Numerical methods for financial calculus (6)

MATH7502 Topics in applied discrete mathematics (6) MATH7503 Topics in mathematical programming and optimization (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this minor. Students who do not fulfill this requirement are required to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Offered to students

2014

admitted to Year 1 in

Objectives:

The Minor in Operations Research & Mathematical Programming provides students with fundamental knowledge in optimization, computational algorithm, mathematical modeling, and decision making. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from decision sciences and logistic industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and demonstrate understanding of fundamental concepts in operations research & mathematical programming (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics/Physics

Minor in Mathematics

Minor in Computational & Financial Mathematics

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Courses (18 credits)

MATH1013 University mathematics II (6)
MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

MATH3901 Operations research I (6)
MATH3904 Introduction to optimization (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3405 Differential equations (6) MATH3600 Discrete mathematics (6)

MATH3905 Queueing theory and simulation (6)

MATH3906 Financial calculus (6)
MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6)

MATH4902 Operations research II (6)

MATH4907 Numerical methods for financial calculus (6) MATH7502 Topics in applied discrete mathematics (6)

MATH7503 Topics in mathematical programming and optimization (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this minor. Students who do not fulfill this requirement are required to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Offered to students 2013

admitted to Year 1 in

Objectives:

The Minor in Operations Research & Mathematical Programming provides students with fundamental knowledge in optimization, computational algorithm, mathematical modeling, and decision making. It is specifically designed for students who are interested in the above subjects and those whose majors require sophisticated mathematical skills. It aims to nurture quantitative reasoning, logical, analytical and critical thinking, innovative imagination, meticulous care to work, ability to conceptualize, skills for problem-solving and skills to tackle novel situations and ill-defined problems. It is particularly useful for solving mathematical problems arising from decision sciences and logistic industry.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: describe and demonstrate understanding of fundamental concepts in operations research & mathematical programming (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply mathematical methods and analysis to real life problems (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics

Major in Mathematics/Physics

Minor in Mathematics

Minor in Computational & Financial Mathematics

Required courses (42 credits)

1. Introductory level courses (18 credits) (note 3)

Disciplinary Core Courses (18 credits)

MATH1013 University mathematics II (6)
MATH2101 Linear algebra I (6)
MATH2211 Multivariable calculus (6)

2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

MATH3901 Operations research I (6)
MATH3904 Introduction to optimization (6)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

MATH3405 Differential equations (6) MATH3600 Discrete mathematics (6)

MATH3905 Queueing theory and simulation (6)

MATH3906 Financial calculus (6) MATH3911 Game theory and strategy (6)

MATH3943 Network models in operations research (6)

MATH4902 Operations research II (6)

MATH4907 Numerical methods for financial calculus (6) MATH7502 Topics in applied discrete mathematics (6)

MATH7503 Topics in mathematical programming and optimization (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 2 or above in HKDSE Extended Module 1 or 2 of Mathematics or equivalent to take this minor. Students who do not fulfill this requirement are required to take MATH1011 University mathematics I.
- 3. Students taking the Mathematics related major/minor should check the exemption and replacement arrangement for the introductory level Disciplinary Core Mathematics courses at https://www.scifac.hku.hk/current/ug/academic/overlapping-course-requirements.

Remarks:

Minor Title Minor in Physics

Offered to students 2020

admitted to Year 1 in

Objectives:

The Minor in Physics is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses which provides them to pursue a wide range of topics from the very small scale of nanomaterials to the large scale of astrophysics.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: analyze some physics problems qualitatively and quantitatively (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Physics

Major in Physics (Intensive)

Required courses (42 credits)

1. Introductory level courses (24 credits)

Disciplinary Core Courses (6 credits)

PHYS1250 Fundamental physics (6)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses:

PHYS1150 Problem solving in physics (6)
PHYS2055 Introductory relativity (6)
PHYS2150 Methods in physics I (6)
PHYS2155 Methods in physics II (6)

PHYS2160 Introductory computational physics (6)

PHYS2250 Introductory mechanics (6)

PHYS2255 Introductory electricity and magnetism (6)
PHYS2261 Introductory heat and thermodynamics (6)
PHYS2265 Introductory quantum physics (6)

2. Advanced level courses (18 credits)

Disciplinary Electives (18 credits)

At least 18 credits selected from the following courses: List A

PHYS3150 Theoretical physics (6)
PHYS3151 Machine learning in physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3650 Observational astronomy (6) PHYS3653 Astrophysics (6)

PHYS3650 Astronomy laboratory (6)
PHYS3750 Laser and spectroscopy (6)
PHYS3760 Physics laboratory (6)
PHYS3850 Physical Optics (6)
PHYS3850 Atomic and nuclear physics

PHYS3851 Atomic and nuclear physics (6) PHYS4150 Computational physics (6)

PHYS4151 Data analysis and modeling in physics (6)
PHYS4351 Advanced quantum mechanics (6)
PHYS4450 Advanced electromagnetism (6)
PHYS4550 Advanced statistical mechanics (6)

PHYS4551 Solid state physics (6) PHYS4650 Stellar physics (6) PHYS4652 Planetary science (6) Cosmology (6) **PHYS4653** General relativity (6) **PHYS4654** Interstellar medium (6) **PHYS4655 PHYS4656** Advanced astrophysics (6) PHYS4850 Particle physics (6)

PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)
PHYS7450 Graduate electromagnetism (6)
PHYS7550 Graduate statistical mechanics (6)

PHYS7750 Nanophysics (6)

Notes:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course

("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

Minor Title Minor in Physics

Offered to students

admitted to Year 1 in

Objectives:

The Minor in Physics is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses which provides them to pursue a wide range of topics from the very small scale of nanomaterials to the large scale of astrophysics.

Learning Outcomes:

By the end of this programme, students should be able to:

2019

- PLO 1: identify and describe physical systems with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: analyze some physics problems qualitatively and quantitatively (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Physics (Intensive)

Major in Physics (Inte	nsive)	
Required courses	s (42 credits)	
II -	vel courses (24 credits)	
·	Courses (6 credits)	
PHYS1250	Fundamental physics (6)	
Disciplinary Electi	,	
	its selected from the following courses:	
PHYS1150	Problem solving in physics (6)	
PHYS2055	Introductory relativity (6)	
PHYS2150	Methods in physics I (6)	
PHYS2155	Methods in physics II (6)	
PHYS2160	Introductory computational physics (6)	
PHYS2250	Introductory mechanics (6)	
PHYS2255	Introductory electricity and magnetism (6)	
PHYS2261	Introductory heat and thermodynamics (6)	
PHYS2265	Introductory quantum physics (6)	
	courses (18 credits)	
Disciplinary Electi		
	its selected from the following courses:	
List A	to colocica from the following courses.	
PHYS3150	Theoretical physics (6)	
PHYS3151	Machine learning in physics (6)	
PHYS3350	Classical mechanics (6)	
PHYS3351	Quantum mechanics (6)	
PHYS3450	Electromagnetism (6)	
PHYS3550	Statistical mechanics & thermodynamics (6)	
PHYS3650	Observational astronomy (6)	
PHYS3653	Astrophysics (6)	
PHYS3660	Astronomy laboratory (6)	
PHYS3750	Laser and spectroscopy (6)	
PHYS3760	Physics laboratory (6)	
PHYS3850	Physical Optics (6)	[previous title: Waves and optics (6)]
PHYS3851	Atomic and nuclear physics (6)	-
PHYS4150	Computational physics (6)	
PHYS4151	Data analysis and modeling in physics (6)	
PHYS4351	Advanced quantum mechanics (6)	
PHYS4450	Advanced electromagnetism (6)	
PHYS4550	Advanced statistical mechanics (6)	
PHYS4551	Solid state physics (6)	
PHYS4650	Stellar physics (6)	
PHYS4652	Planetary science (6)	
PHYS4653	Cosmology (6)	
PHYS4654	General relativity (6)	
PHYS4655	Interstellar medium (6)	
PHYS4656	Advanced astrophysics (6)	
PHYS4850	Particle physics (6)	
PHYS7350	Graduate classical mechanics (6)	
PHYS7351	Graduate quantum mechanics (6)	
PHYS7450	Graduate electromagnetism (6)	
PHYS7550	Graduate statistical mechanics (6)	
PHYS7750	Nanophysics (6)	

Notes:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course

("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

Minor Title Minor in Physics

Offered to students 2018

admitted to Year 1 in

Objectives:

The Minor in Physics is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses which provides them to pursue a wide range of topics from the very small scale of nanomaterials to the large scale of astrophysics.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: analyze some physics problems qualitatively and quantitatively (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Physics

Major in Physics (Intensive)

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Required course		
1. Introductory lev	vel courses (24 credits)	
Disciplinary Core	Courses (6 credits)	
PHYS1250	Fundamental physics (6)	
Disciplinary Elect	ives (18 credits)	
At least 18 credi	its selected from the following courses:	
PHYS1150	Problem solving in physics (6)	
PHYS2055	Introductory relativity (6)	[previous title: Introduction to relativity (6)]
PHYS2150	Methods in physics I (6)	
PHYS2155	Methods in physics II (6)	
PHYS2250	Introductory mechanics (6)	
PHYS2255	Introductory electricity and magnetism (6)	
PHYS2261	Introductory heat and thermodynamics (6)	
PHYS2265	Introductory quantum physics (6)	[previous title: Modern physics (6)]
2. Advanced level	courses (18 credits)	
Disciplinary Elect	ives (18 credits)	
At least 18 credi	its selected from the following courses:	
List A		
PHYS3150	Theoretical physics (6)	
PHYS3151	Machine learning in physics (6)	
PHYS3350	Classical mechanics (6)	
PHYS3351	Quantum mechanics (6)	
PHYS3450	Electromagnetism (6)	
PHYS3550	Statistical mechanics & thermodynamics (6)	
PHYS3650	Observational astronomy (6)	
PHYS3653	Astrophysics (6)	
PHYS3660	Astronomy laboratory (6)	
PHYS3750	Laser and spectroscopy (6)	
PHYS3760	Physics laboratory (6)	
PHYS3850	Physical Optics (6)	[previous title: Waves and optics (6)]
PHYS3851	Atomic and nuclear physics (6)	
PHYS4150	Computational physics (6)	
PHYS4151	Data analysis and modeling in physics (6)	
PHYS4351	Advanced quantum mechanics (6)	
PHYS4450	Advanced electromagnetism (6)	
PHYS4550	Advanced statistical mechanics (6)	
PHYS4551	Solid state physics (6)	
PHYS4650	Stellar physics (6)	
PHYS4652	Planetary science (6)	
PHYS4653	Cosmology (6)	
PHYS4654	General relativity (6)	
PHYS4655	Interstellar medium (6)	
PHYS4656	Advanced astrophysics (6)	
PHYS4850	Particle physics (6)	
PHYS7350	Graduate classical mechanics (6)	
PHYS7351	Graduate quantum mechanics (6)	
PHYS7450	Graduate electromagnetism (6)	
PHYS7550	Graduate statistical mechanics (6)	
PHYS7750	Nanophysics (6)	

Notes:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For

details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc

2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

[previous title: Waves and optics (6)]

Minor Title Minor in Physics

Offered to students 2017

admitted to Year 1 in

Objectives:

The Minor in Physics is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses which provides them to pursue a wide range of topics from the very small scale of nanomaterials to the large scale of astrophysics.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: analyze some physics problems qualitatively and quantitatively (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics/Physics

Major in Physics

Major in Physics (Intensive)

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (18 credits)

PHYS1250 Fundamental physics (6)
PHYS2250 Introductory mechanics (6)
PHYS2265 Introductory quantum physics (6)

PHYS2265 Introductory quantum physics (6) [previous title: Modern physics (6)]

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

List A

PHYS3150 Theoretical physics (6)
PHYS3151 Machine learning in physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6) PHYS3551 Introductory solid state physics (6)

PHYS3551 Introductory solid state physics
PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)
PHYS3653 Astrophysics (6)
PHYS3600 Astronomy laboratory (6)
PHYS3750 Laser and spectroscopy (6)

PHYS3751 Physics of nanomaterials (6)
PHYS3760 Physics laboratory (6)
PHYS3850 Physical Optics (6)
PHYS3851 Atomic and nuclear physics (6)

PHYS3851 Atomic and nuclear physics (6)
PHYS3999 Directed studies in physics (6)
PHYS4150 Computational physics (6)

PHYS4151 Data analysis and modeling in physics (6)
PHYS4350 Advanced classical mechanics (6)
PHYS4351 Advanced quantum mechanics (6)
PHYS4450 Advanced electromagnetism (6)
PHYS4550 Advanced statistical mechanics (6)

PHYS4551 Solid state physics (6) PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

Planetary science (6) PHYS4652 Cosmology (6) PHYS4653 General relativity (6) **PHYS4654** Interstellar medium (6) **PHYS4655 PHYS4656** Advanced astrophysics (6) PHYS4750 Experimental physics (6) Particle physics (6) **PHYS4850** PHYS4966 Physics internship (6) PHYS4999 Physics project (12)

PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)
PHYS7450 Graduate electromagnetism (6)
PHYS7550 Graduate statistical mechanics (6)
PHYS7551 Graduate solid state physics (6)

PHYS7650	Stellar atmospheres (6)	
PHYS7750	Nanophysics (6)	

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks

[previous title: Modern physics (6)]

[previous title: Waves and optics (6)]

Minor Title Minor in Physics

Offered to students 2016

admitted to Year 1 in

Objectives:

The Minor in Physics is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses which provides them to pursue a wide range of topics from the very small scale of nanomaterials to the large scale of astrophysics.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: analyze some physics problems qualitatively and quantitatively (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics/Physics

Major in Physics

Major in Physics (Intensive)

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (18 credits)

PHYS1250 Fundamental physics (6)
PHYS2250 Introductory mechanics (6)
PHYS2265 Introductory quantum physics (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to

prerequisite requirements. The current course list includes courses in List A: List A

PHYS3150 Theoretical physics (6)
PHYS3151 Machine learning in physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3551 Introductory solid state physics (6)
PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)
PHYS3653 Astrophysics (6)
PHYS3600 Astronomy laboratory (6)
PHYS3750 Laser and spectroscopy (6)

PHYS3751 Physics of nanomaterials (6)
PHYS3760 Physics laboratory (6)
PHYS3850 Physical Optics (6)
PHYS3851 Atomic and nuclear physics (6)

PHYS3851 Atomic and nuclear physics (6)
PHYS4150 Computational physics (6)

PHYS4151 Data analysis and modeling in physics (6)
PHYS4350 Advanced classical mechanics (6)
PHYS4351 Advanced quantum mechanics (6)
PHYS4450 Advanced electromagnetism (6)
PHYS4550 Advanced statistical mechanics (6)

PHYS4551 Solid state physics (6) PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

Planetary science (6) PHYS4652 Cosmology (6) PHYS4653 General relativity (6) **PHYS4654** Interstellar medium (6) **PHYS4655 PHYS4656** Advanced astrophysics (6) PHYS4750 Experimental physics (6) Particle physics (6) **PHYS4850** PHYS4966 Physics internship (6) PHYS4999 Physics project (12)

PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)
PHYS7450 Graduate electromagnetism (6)
PHYS7550 Graduate statistical mechanics (6)
PHYS7551 Graduate solid state physics (6)

PHYS7650	Stellar atmospheres (6)
PHYS7750	Nanophysics (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks

[previous title: Modern physics (6)]

Minor Title Minor in Physics

Offered to students 2015

admitted to Year 1 in

Objectives:

The Minor in Physics is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses which provides them to pursue a wide range of topics from the very small scale of nanomaterials to the large scale of astrophysics.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: analyze some physics problems qualitatively and quantitatively (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics/Physics

Major in Physics

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (18 credits)

PHYS1250 Fundamental physics (6)
PHYS2250 Introductory mechanics (6)
PHYS2265 Introductory quantum physics (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

List A

PHYS3150 Theoretical physics (6)
PHYS3151 Machine learning in physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3551 Introductory solid state physics (6)
PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)
PHYS3653 Astrophysics (6)

PHYS3660 Astronomy laboratory (6)
PHYS3750 Laser and spectroscopy (6)
PHYS3751 Physics of nanomaterials (6)
PHYS3760 Physics laboratory (6)
PHYS3760 Physical Optics (6)

PHYS3850 Physical Optics (6) [previous title: Waves and optics (6)]

PHYS3851 Atomic and nuclear physics (6)
PHYS3999 Directed studies in physics (6)
PHYS4150 Computational physics (6)

PHYS4151 Data analysis and modeling in physics (6)
PHYS4350 Advanced classical mechanics (6)
PHYS4351 Advanced quantum mechanics (6)
PHYS4450 Advanced electromagnetism (6)
PHYS4550 Advanced statistical mechanics (6)

PHYS4551 Solid state physics (6)
PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6) PHYS4653 Cosmology (6) General relativity (6) **PHYS4654** Interstellar medium (6) **PHYS4655** Advanced astrophysics (6) PHYS4656 PHYS4750 Experimental physics (6) PHYS4850 Particle physics (6) Physics internship (6) **PHYS4966** PHYS4999 Physics project (12)

PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)
PHYS7450 Graduate electromagnetism (6)
PHYS7550 Graduate statistical mechanics (6)
PHYS7551 Graduate solid state physics (6)
PHYS7650 Stellar atmospheres (6)

PHYS7750 Nanophysics (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks

[previous title: Modern physics (6)]

[previous title: Waves and optics (6)]

Minor Title Minor in Physics

Offered to students 2014

admitted to Year 1 in

Objectives:

The Minor in Physics is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses which provides them to pursue a wide range of topics from the very small scale of nanomaterials to the large scale of astrophysics.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: analyze some physics problems qualitatively and quantitatively (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics/Physics

Major in Physics

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (18 credits)

PHYS1250 Fundamental physics (6)
PHYS2250 Introductory mechanics (6)
PHYS2265 Introductory quantum physics (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

PHYS3150 Theoretical physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3551 Introductory solid state physics (6)
PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)
PHYS3750 Laser and spectroscopy (6)
PHYS3751 Physics of nanomaterials (6)

PHYS3850 Physical Optics (6)
PHYS3851 Atomic and nuclear physics (6)

PHYS3999 Directed studies in physics (6)
PHYS4150 Computational physics (6)

PHYS4151 Data analysis and modeling in physics (6)
PHYS4350 Advanced classical mechanics (6)
PHYS4351 Advanced quantum mechanics (6)
PHYS4450 Advanced electromagnetism (6)
PHYS4550 Advanced statistical mechanics (6)

PHYS4551 Solid state physics (6) PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

Planetary science (6) PHYS4652 Cosmology (6) PHYS4653 General relativity (6) **PHYS4654 PHYS4655** Interstellar medium (6) PHYS4750 Experimental physics (6) PHYS4850 Particle physics (6) PHYS4966 Physics internship (6) Physics project (12) PHYS4999

PHYS4999 Physics project (12)
PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)
PHYS7450 Graduate electromagnetism (6)
PHYS7550 Graduate statistical mechanics (6)
PHYS7551 Graduate solid state physics (6)
PHYS7650 Stellar atmospheres (6)
PHYS7750 Nanophysics (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For

details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc

2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

[previous title: Modern physics (6)]

[previous title: Waves and optics (6)]

Minor Title Minor in Physics

Offered to students 2013

admitted to Year 1 in

Objectives:

The Minor in Physics is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses which provides them to pursue a wide range of topics from the very small scale of nanomaterials to the large scale of astrophysics.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: analyze some physics problems qualitatively and quantitatively (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics/Physics

Major in Physics

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (18 credits)

PHYS1250 Fundamental physics (6)
PHYS2250 Introductory mechanics (6)
PHYS2265 Introductory quantum physics (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

List A
PHYS3150 Theoretical physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3551 Introductory solid state physics (6)
PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)
PHYS3750 Laser and spectroscopy (6)
PHYS3751 Physics of nanomaterials (6)

PHYS3850 Physical Optics (6)
PHYS3851 Atomic and nuclear physics (6)

PHYS3999 Directed studies in physics (6) PHYS4150 Computational physics (6)

PHYS4151 Data analysis and modeling in physics (6)
PHYS4350 Advanced classical mechanics (6)
PHYS4351 Advanced quantum mechanics (6)
PHYS4450 Advanced electromagnetism (6)
PHYS4550 Advanced statistical mechanics (6)

PHYS4551 Solid state physics (6) PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

Planetary science (6) PHYS4652 PHYS4653 Cosmology (6) General relativity (6) **PHYS4654** Interstellar medium (6) **PHYS4655** PHYS4750 Experimental physics (6) Particle physics (6) PHYS4850 PHYS4966 Physics internship (6) PHYS4999 Physics project (12)

PHYS4999 Physics project (12)
PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)
PHYS7450 Graduate electromagnetism (6)
PHYS7550 Graduate statistical mechanics (6)
PHYS7551 Graduate solid state physics (6)
PHYS7650 Stellar atmospheres (6)
PHYS7750 Nanophysics (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For

details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc

2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

[previous title: Modern physics (6)]

Minor Title Minor in Physics

Offered to students 2012

admitted to Year 1 in

Objectives:

The Minor in Physics is intended to provide interested students with a fundamental outlook on the subject. Students would acquire a taste of the subject through a large selection of elective courses which provides them to pursue a wide range of topics from the very small scale of nanomaterials to the large scale of astrophysics.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: identify and describe physical systems with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- PLO 2: analyze some physics problems qualitatively and quantitatively (by means of coursework, tutorial classes and laboratory works in the curriculum)
- PLO 3: communicate and collaborate with people effectively in scientific issues (by means of group projects, tutorial sessions and presentation opportunities in the curriculum)

Impermissible Combinations:

Major in Mathematics/Physics

Major in Physics

Required courses (42 credits)

1. Introductory level courses (18 credits)

Disciplinary Core Courses (18 credits)

PHYS1250 Fundamental physics (6)
PHYS2250 Introductory mechanics (6)
PHYS2265 Introductory quantum physics (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits of advanced level Physics courses (PHYS3XXX or PHYS4XXX or PHYS7XXX level), subject to prerequisite requirements. The current course list includes courses in List A:

PHYS3150 Theoretical physics (6)
PHYS3350 Classical mechanics (6)
PHYS3351 Quantum mechanics (6)
PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

PHYS3551 Introductory solid state physics (6)
PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)
PHYS3652 Principles of astronomy (6)
PHYS3750 Laser and spectroscopy (6)
PHYS3751 Physics of nanomaterials (6)

PHYS3850 Physical Optics (6) [previous title: Waves and optics (6)]

PHYS3851 Atomic and nuclear physics (6)
PHYS3999 Directed studies in physics (6)
PHYS4150 Computational physics (6)
PHYS4151 Data analysis and modeling in physics (6)

PHYS4350 Advanced classical mechanics (6)
PHYS4351 Advanced quantum mechanics (6)
PHYS4450 Advanced electromagnetism (6)
PHYS4550 Advanced statistical mechanics (6)

PHYS4551 Solid state physics (6) PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

Planetary science (6) PHYS4652 Cosmology (6) PHYS4653 General relativity (6) **PHYS4654 PHYS4655** Interstellar medium (6) PHYS4750 Experimental physics (6) PHYS4850 Particle physics (6) PHYS4966 Physics internship (6) Physics project (12) PHYS4999

PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)
PHYS7450 Graduate electromagnetism (6)
PHYS7550 Graduate statistical mechanics (6)
PHYS7551 Graduate solid state physics (6)
PHYS7650 Stellar atmospheres (6)
PHYS7750 Nanophysics (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For

details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc

2. Students must have level 3 or above in HKDSE Physics or equivalent to take this minor. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Offered to students 2020

admitted to Year 1 in

Objectives:

The Minor in Plant Science is offered to students who are fascinated by the diversity and beauty of plants and the molecular mechanisms underlying their growth and development. Knowledge in plant science is essential for tackling daily-life issues such as the production of high-quality food, utilization of plant products as biofuels and extraction of beneficial phytochemicals. Recent advances in plant genetic engineering have also allowed scientists to manipulate plant growth and development for nutritional and environmental benefits. This minor aims to provide broad training in the biology of plants from the molecular to the organism level as well as the agricultural and nutritional applications of plants and plant-derived products.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate plants as an important part in our culture and their functions and roles in food, nutrition, and environment (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 2: understand and describe the fundamental concepts of plant evolution, anatomy, biochemistry, physiology and biotechnology (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 3: acquire necessary academic and practical skills for careers in government agencies, secondary school teaching and postgraduate research in different disciplines of plant science (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)

Impermissible Combinations:

NIL

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3107 Plant physiology (6)

BIOL3210 Grain production and utilization (6) BIOL3314 Plant structure and evolution (6)

BIOL3408 Genetics (6)
BIOL4209 Functional foods (6)

BIOL4411 Plant and food biotechnology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2019

admitted to Year 1 in

Objectives:

The Minor in Plant Science is offered to students who are fascinated by the diversity and beauty of plants and the molecular mechanisms underlying their growth and development. Knowledge in plant science is essential for tackling daily-life issues such as the production of high-quality food, utilization of plant products as biofuels and extraction of beneficial phytochemicals. Recent advances in plant genetic engineering have also allowed scientists to manipulate plant growth and development for nutritional and environmental benefits. This minor aims to provide broad training in the biology of plants from the molecular to the organism level as well as the agricultural and nutritional applications of plants and plant-derived products.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate plants as an important part in our culture and their functions and roles in food, nutrition, and environment (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 2: understand and describe the fundamental concepts of plant evolution, anatomy, biochemistry, physiology and biotechnology (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 3: acquire necessary academic and practical skills for careers in government agencies, secondary school teaching and postgraduate research in different disciplines of plant science (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)

Impermissible Combinations:

NIL

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3107 Plant physiology (6)

BIOL3210 Grain production and utilization (6)
BIOL3314 Plant structure and evolution (6)

BIOL3408 Genetics (6)
BIOL4209 Functional foods (6)

BIOL4411 Plant and food biotechnology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2018

admitted to Year 1 in

Objectives:

The Minor in Plant Science is offered to students who are fascinated by the diversity and beauty of plants and the molecular mechanisms underlying their growth and development. Knowledge in plant science is essential for tackling daily-life issues such as the production of high-quality food, utilization of plant products as biofuels and extraction of beneficial phytochemicals. Recent advances in plant genetic engineering have also allowed scientists to manipulate plant growth and development for nutritional and environmental benefits. This minor aims to provide broad training in the biology of plants from the molecular to the organism level as well as the agricultural and nutritional applications of plants and plant-derived products.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate plants as an important part in our culture and their functions and roles in food, nutrition, and environment (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 2: understand and describe the fundamental concepts of plant evolution, anatomy, biochemistry, physiology and biotechnology (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 3: acquire necessary academic and practical skills for careers in government agencies, secondary school teaching and postgraduate research in different disciplines of plant science (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)

Impermissible Combinations:

NIL

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3107 Plant physiology (6)

BIOL3210 Grain production and utilization (6)
BIOL3314 Plant structure and evolution (6)

BIOL3408 Genetics (6)
BIOL4209 Functional foods (6)

BIOL4411 Plant and food biotechnology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2017

admitted to Year 1 in

Objectives:

The Minor in Plant Science is offered to students who are fascinated by the diversity and beauty of plants and the molecular mechanisms underlying their growth and development. Knowledge in plant science is essential for tackling daily-life issues such as the production of high-quality food, utilization of plant products as biofuels and extraction of beneficial phytochemicals. Recent advances in plant genetic engineering have also allowed scientists to manipulate plant growth and development for nutritional and environmental benefits. This minor aims to provide broad training in the biology of plants from the molecular to the organism level as well as the agricultural and nutritional applications of plants and plant-derived products.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate plants as an important part in our culture and their functions and roles in food, nutrition, and environment (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 2: understand and describe the fundamental concepts of plant evolution, anatomy, biochemistry, physiology and biotechnology (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 3: acquire necessary academic and practical skills for careers in government agencies, secondary school teaching and postgraduate research in different disciplines of plant science (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)

Impermissible Combinations:

NIL

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3107 Plant physiology (6)

BIOL3210 Grain production and utilization (6)
BIOL3314 Plant structure and evolution (6)

BIOL3408 Genetics (6) BIOL4209 Functional foods (6)

BIOL4411 Plant and food biotechnology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2016

admitted to Year 1 in

Objectives:

The Minor in Plant Science is offered to students who are fascinated by the diversity and beauty of plants and the molecular mechanisms underlying their growth and development. Knowledge in plant science is essential for tackling daily-life issues such as the production of high-quality food, utilization of plant products as biofuels and extraction of beneficial phytochemicals. Recent advances in plant genetic engineering have also allowed scientists to manipulate plant growth and development for nutritional and environmental benefits. This minor aims to provide broad training in the biology of plants from the molecular to the organism level as well as the agricultural and nutritional applications of plants and plant-derived products.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate plants as an important part in our culture and their functions and roles in food, nutrition, and environment (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 2: understand and describe the fundamental concepts of plant evolution, anatomy, biochemistry, physiology and biotechnology (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 3: acquire necessary academic and practical skills for careers in government agencies, secondary school teaching and postgraduate research in different disciplines of plant science (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)

Impermissible Combinations:

NII

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3107 Plant physiology (6)

BIOL3210 Grain production and utilization (6)
BIOL3314 Plant structure and evolution (6)

BIOL3408 Genetics (6)
BIOL4209 Functional foods (6)

BIOL4411 Plant and food biotechnology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2015

admitted to Year 1 in

Objectives:

The Minor in Plant Science is offered to students who are fascinated by the diversity and beauty of plants and the molecular mechanisms underlying their growth and development. Knowledge in plant science is essential for tackling daily-life issues such as the production of high-quality food, utilization of plant products as biofuels and extraction of beneficial phytochemicals. Recent advances in plant genetic engineering have also allowed scientists to manipulate plant growth and development for nutritional and environmental benefits. This minor aims to provide broad training in the biology of plants from the molecular to the organism level as well as the agricultural and nutritional applications of plants and plant-derived products.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate plants as an important part in our culture and their functions and roles in food, nutrition, and environment (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 2: understand and describe the fundamental concepts of plant evolution, anatomy, biochemistry, physiology and biotechnology (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 3: acquire necessary academic and practical skills for careers in government agencies, secondary school teaching and postgraduate research in different disciplines of plant science (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)

Impermissible Combinations:

NIL

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3107 Plant physiology (6)

BIOL3210 Grain production and utilization (6) BIOL3314 Plant structure and evolution (6)

BIOL3408 Genetics (6)
BIOL4209 Functional foods (6)

BIOL4411 Plant and food biotechnology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2014

admitted to Year 1 in

Objectives:

The Minor in Plant Science is offered to students who are fascinated by the diversity and beauty of plants and the molecular mechanisms underlying their growth and development. Knowledge in plant science is essential for tackling daily-life issues such as the production of high-quality food, utilization of plant products as biofuels and extraction of beneficial phytochemicals. Recent advances in plant genetic engineering have also allowed scientists to manipulate plant growth and development for nutritional and environmental benefits. This minor aims to provide broad training in the biology of plants from the molecular to the organism level as well as the agricultural and nutritional applications of plants and plant-derived products.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate plants as an important part in our culture and their functions and roles in food, nutrition, and environment (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 2: understand and describe the fundamental concepts of plant evolution, anatomy, biochemistry, physiology and biotechnology (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the
- PLO 3: acquire necessary academic and practical skills for careers in government agencies, secondary school teaching and postgraduate research in different disciplines of plant science (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)

Impermissible Combinations:

NIL

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6)

BIOL1309 Evolutionary diversity (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3107 Plant physiology (6)

Grain production and utilization (6) BIOL3210 Plant structure and evolution (6) **BIOL3314**

BIOL3408 Genetics (6) Functional foods (6) BIOL4209

BIOL4411 Plant and food biotechnology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc

Remarks:

Offered to students 2013

admitted to Year 1 in

Objectives:

The Minor in Plant Science is offered to students who are fascinated by the diversity and beauty of plants and the molecular mechanisms underlying their growth and development. Knowledge in plant science is essential for tackling daily-life issues such as the production of high-quality food, utilization of plant products as biofuels and extraction of beneficial phytochemicals. Recent advances in plant genetic engineering have also allowed scientists to manipulate plant growth and development for nutritional and environmental benefits. This minor aims to provide broad training in the biology of plants from the molecular to the organism level as well as the agricultural and nutritional applications of plants and plant-derived products.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate plants as an important part in our culture and their functions and roles in food, nutrition, and environment (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 2: understand and describe the fundamental concepts of plant evolution, anatomy, biochemistry, physiology and biotechnology (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 3: acquire necessary academic and practical skills for careers in government agencies, secondary school teaching and postgraduate research in different disciplines of plant science (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)

Impermissible Combinations:

NIL

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3107 Plant physiology (6)

BIOL3210 Grain production and utilization (6)
BIOL3314 Plant structure and evolution (6)

BIOL3408 Genetics (6)
BIOL4209 Functional foods (6)

BIOL4411 Plant and food biotechnology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2012

admitted to Year 1 in

Objectives:

The Minor in Plant Science is offered to students who are fascinated by the diversity and beauty of plants and the molecular mechanisms underlying their growth and development. Knowledge in plant science is essential for tackling daily-life issues such as the production of high-quality food, utilization of plant products as biofuels and extraction of beneficial phytochemicals. Recent advances in plant genetic engineering have also allowed scientists to manipulate plant growth and development for nutritional and environmental benefits. This minor aims to provide broad training in the biology of plants from the molecular to the organism level as well as the agricultural and nutritional applications of plants and plant-derived products.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: appreciate plants as an important part in our culture and their functions and roles in food, nutrition, and environment (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 2: understand and describe the fundamental concepts of plant evolution, anatomy, biochemistry, physiology and biotechnology (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)
- PLO 3: acquire necessary academic and practical skills for careers in government agencies, secondary school teaching and postgraduate research in different disciplines of plant science (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)

Impermissible Combinations:

NIL

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits selected from the following courses:

BIOL1110 From molecules to cells (6)
BIOL1309 Evolutionary diversity (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

At least 24 credits selected from the following courses:

BIOL3107 Plant physiology (6)

BIOL3210 Grain production and utilization (6)
BIOL3314 Plant structure and evolution (6)

BIOL3408 Genetics (6)
BIOL4209 Functional foods (6)

BIOL4411 Plant and food biotechnology (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2020

admitted to Year 1 in

Objectives:

The Minor in Risk Management aims to provide interested students with basic concepts of risk management and fundamental skills of employing various statistical techniques for managing risk. The minor curriculum is particularly designed for students from different majors to enhance their interests in Risk Management or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: acquire basic understanding and identify the generic risk management issues and techniques (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply elementary methods and models for risk assessment and management (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: acquire and interpret relevant data and information for risk management (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

List A

STAT1601 Elementary statistical methods (6) Business statistics (6) STAT1602 Introductory statistics (6) STAT1603 STAT2601 Probability and statistics I (6)

List B

Probability and statistics II (6) STAT2602 Data management with SAS (6) STAT2603

Introduction to R programming and elementary data analysis STAT2604

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits) At least 30 credits selected from the following courses:

STAT3609 The statistics of investment risk (6) STAT3610 Risk management and insurance (6) Computer-aided data analysis (6) STAT3611 STAT3612 Statistical machine learning (6) Business forecasting (6) STAT3614 Practical mathematics for investment (6) STAT3615 STAT3618 Derivatives and risk management (6) Time-series analysis (6) STAT4601 STAT4603 Current topics in risk management (6)

Risk management and Basel Accords in banking and finance STAT4606

Credit risk analysis (6) STAT4607 STAT4608 Market risk analysis (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2019

admitted to Year 1 in

Objectives:

The Minor in Risk Management aims to provide interested students with basic concepts of risk management and fundamental skills of employing various statistical techniques for managing risk. The minor curriculum is particularly designed for students from different majors to enhance their interests in Risk Management or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: acquire basic understanding and identify the generic risk management issues and techniques (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply elementary methods and models for risk assessment and management (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: acquire and interpret relevant data and information for risk management (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

List A

STAT1601 Elementary statistical methods (6)
STAT1602 Business statistics (6)
STAT1603 Introductory statistics (6)
STAT2601 Probability and statistics I (6)

List B

STAT2602 Probability and statistics II (6) STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

(6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:
STAT3609
The statistics of investment risk (6)
STAT3610
Risk management and insurance (6)
STAT3611
Computer-aided data analysis (6)
STAT3612
Statistical machine learning (6)
STAT3614
Business forecasting (6)
STAT3615
Practical mathematics for investment (6)
STAT3619
Perivotives and risk management (6)

STAT3615 Practical mathematics for investment (6 STAT3618 Derivatives and risk management (6) STAT4601 Time-series analysis (6) STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6)

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Offered to students 2018

admitted to Year 1 in

Objectives:

The Minor in Risk Management aims to provide interested students with basic concepts of risk management and fundamental skills of employing various statistical techniques for managing risk. The minor curriculum is particularly designed for students from different majors to enhance their interests in Risk Management or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: acquire basic understanding and identify the generic risk management issues and techniques (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply elementary methods and models for risk assessment and management (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: acquire and interpret relevant data and information for risk management (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

List A

STAT1601 Elementary statistical methods (6)
STAT1602 Business statistics (6)
STAT1603 Introductory statistics (6)
STAT2601 Probability and statistics I (6)

List B

STAT2602 Probability and statistics II (6) STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

(6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits) At least 30 credits selected from the following courses:

STAT3609 The statistics of investment risk (6)
STAT3610 Risk management and insurance (6)
STAT3611 Computer-aided data analysis (6)
STAT3612 Statistical machine learning (6)
STAT3614 Business forecasting (6)
STAT3615 Practical mathematics for investment (6)

STAT3615 Practical mathematics for investment (6) STAT3618 Derivatives and risk management (6) STAT4601 Time-series analysis (6)

STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6)

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

[previous title: Data mining (6)]

Remarks:

Offered to students 2017

admitted to Year 1 in

Objectives:

The Minor in Risk Management aims to provide interested students with basic concepts of risk management and fundamental skills of employing various statistical techniques for managing risk. The minor curriculum is particularly designed for students from different majors to enhance their interests in Risk Management or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: acquire basic understanding and identify the generic risk management issues and techniques (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply elementary methods and models for risk assessment and management (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: acquire and interpret relevant data and information for risk management (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

List A

STAT1601 Elementary statistical methods (6)
STAT1602 Business statistics (6)
STAT1603 Introductory statistics (6)
STAT2601 Probability and statistics I (6)

List B

STAT4601

STAT2602 Probability and statistics II (6) STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

(6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits) At least 30 credits selected from the following courses:

STAT3609 The statistics of investment risk (6)
STAT3610 Risk management and insurance (6)
STAT3611 Computer-aided data analysis (6)
STAT3612 Statistical machine learning (6)
STAT3614 Business forecasting (6)
STAT3615 Practical mathematics for investment (6)
STAT3618 Derivatives and risk management (6)

Time-series analysis (6)
Current topics in risk management (6)

STAT4603 Current topics in risk management (6)
STAT4606 Risk management and Basel Accords in banking and finance

(6

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

[previous title: Data mining (6)]

Remarks:

Offered to students 2016

admitted to Year 1 in

Objectives:

The Minor in Risk Management aims to provide interested students with basic concepts of risk management and fundamental skills of employing various statistical techniques for managing risk. The minor curriculum is particularly designed for students from different majors to enhance their interests in Risk Management or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: acquire basic understanding and identify the generic risk management issues and techniques (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply elementary methods and models for risk assessment and management (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: acquire and interpret relevant data and information for risk management (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

List A

STAT1601 Elementary statistical methods (6)
STAT1602 Business statistics (6)
STAT1603 Introductory statistics (6)
STAT2601 Probability and statistics I (6)

List B

STAT2602 Probability and statistics II (6) STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

(6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits) At least 30 credits selected from the following courses:

STAT3609 The statistics of investment risk (6)
STAT3610 Risk management and insurance (6)
STAT3611 Computer-aided data analysis (6)
STAT3612 Statistical machine learning (6)
STAT3614 Business forecasting (6)

STAT3615 Practical mathematics for investment (6)
STAT3618 Derivatives and risk management (6)

STAT4601 Time-series analysis (6)

STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6)

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

[previous title: Data mining (6)]

Remarks:

Offered to students 2015

admitted to Year 1 in

Objectives:

The Minor in Risk Management aims to provide interested students with basic concepts of risk management and fundamental skills of employing various statistical techniques for managing risk. The minor curriculum is particularly designed for students from different majors to enhance their interests in Risk Management or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: acquire basic understanding and identify the generic risk management issues and techniques (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply elementary methods and models for risk assessment and management (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: acquire and interpret relevant data and information for risk management (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

List A

STAT1601 Elementary statistical methods (6)
STAT1602 Business statistics (6)
STAT1603 Introductory statistics (6)
STAT2601 Probability and statistics I (6)

List B

STAT2602 Probability and statistics II (6) STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

(6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits) At least 30 credits selected from the following courses:

STAT3609 The statistics of investment risk (6)
STAT3610 Risk management and insurance (6)
STAT3611 Computer-aided data analysis (6)
STAT3612 Statistical machine learning (6)
STAT3614 Business forecasting (6)
STAT3615 Practical mathematics for investment (6)

STAT3615 Fractical matternatics for investment (6)
STAT3618 Derivatives and risk management (6)
STAT4601 Time-series analysis (6)

STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6)

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

[previous title: Data mining (6)]

Remarks:

Offered to students 2014

admitted to Year 1 in

Objectives:

The Minor in Risk Management aims to provide interested students with basic concepts of risk management and fundamental skills of employing various statistical techniques for managing risk. The minor curriculum is particularly designed for students from different majors to enhance their interests in Risk Management or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: acquire basic understanding and identify the generic risk management issues and techniques (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply elementary methods and models for risk assessment and management (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: acquire and interpret relevant data and information for risk management (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

List A

STAT1601 Elementary statistical methods (6)
STAT1602 Business statistics (6)
STAT1603 Introductory statistics (6)
STAT2601 Probability and statistics I (6)

List B

STAT2602 Probability and statistics II (6) STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

(6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits) At least 30 credits selected from the following courses:

STAT3609 The statistics of investment risk (6)
STAT3610 Risk management and insurance (6)
STAT3611 Computer-aided data analysis (6)
STAT3612 Statistical machine learning (6)
STAT3614 Business forecasting (6)
STAT3615 Precise methomotics for investment (6)

STAT3615 Practical mathematics for investment (6) STAT3618 Derivatives and risk management (6) STAT4601 Time-series analysis (6)

STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6)

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

[previous title: Data mining (6)]

Remarks:

Offered to students 2013

admitted to Year 1 in

Objectives:

The Minor in Risk Management aims to provide interested students with basic concepts of risk management and fundamental skills of employing various statistical techniques for managing risk. The minor curriculum is particularly designed for students from different majors to enhance their interests in Risk Management or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: acquire basic understanding and identify the generic risk management issues and techniques (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply elementary methods and models for risk assessment and management (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: acquire and interpret relevant data and information for risk management (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

List A

STAT1601 Elementary statistical methods (6)

STAT1602 Business statistics (6)
STAT1603 Introductory statistics (6)
STAT2601 Probability and statistics I (6)

List B

STAT2602 Probability and statistics II (6) STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

(6

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits) At least 30 credits selected from the following courses:

STAT3609 The statistics of investment risk (6)
STAT3610 Risk management and insurance (6)
STAT3611 Computer-aided data analysis (6)
STAT3612 Statistical machine learning (6)

STAT3614 Business forecasting (6)
STAT3615 Practical mathematics for investment (6)

STAT3618 Derivatives and risk management (6) STAT4601 Time-series analysis (6)

STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6)

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

[previous title: Data mining (6)]

Remarks:

Offered to students 2012

admitted to Year 1 in

Objectives:

The Minor in Risk Management aims to provide interested students with basic concepts of risk management and fundamental skills of employing various statistical techniques for managing risk. The minor curriculum is particularly designed for students from different majors to enhance their interests in Risk Management or to complement their major of study.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: acquire basic understanding and identify the generic risk management issues and techniques (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: apply elementary methods and models for risk assessment and management (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 3: acquire and interpret relevant data and information for risk management (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Risk Management

Major in Statistics

Minor in Statistics

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

List A STAT1601

STAT1601 Elementary statistical methods (6)

STAT1602 Business statistics (6)
STAT1603 Introductory statistics (6)
STAT2601 Probability and statistics I (6)

List B

STAT2602 Probability and statistics II (6) STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

(6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:
STAT3609 The statistics of investment risk (6)
STAT3610 Risk management and insurance (6)
STAT3611 Computer-aided data analysis (6)

STAT3611 Computer-aided data analysis (6)
STAT3612 Statistical machine learning (6)

STAT3614 Business forecasting (6)

STAT3615 Practical mathematics for investment (6) STAT3618 Derivatives and risk management (6) STAT4601 Time-series analysis (6)

STAT4603 Current topics in risk management (6)

STAT4606 Risk management and Basel Accords in banking and finance

(6)

STAT4607 Credit risk analysis (6) STAT4608 Market risk analysis (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

[previous title: Data mining (6)]

Remarks:

Minor Title Minor in Science Entrepreneurship

Offered to students 2020

admitted to Year 1 in

Objectives:

This Minor aims at broadening the horizon of our undergraduate students with respect to entrepreneurship, so as to arouse their interest in this aspect and better equip them. It is also important for our students to visualize how their training in science (a) is relevant to the real world and (b) can bring about huge insights via critical analysis of the operation of existing enterprises. With the vivid commercial environment and a growing atmosphere for start-ups both locally and globally, this Minor also serves to offer more competitive edge to our students via connecting their academic knowledge with the real world, even though they may not initiate their own start-ups in the short run.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the entrepreneurial process and the principles/models relevant to its different key stages (by means of coursework and tutorial classes in the curriculum)
- PLO 2: gain insights into how a broad range of disciplines contribute to the success of the entrepreneurial process (by means of coursework and tutorial classes in the curriculum)
- PLO 3: evaluate how scientific knowledge can cause impact to the society via entrepreneurship (by means of coursework and tutorial classes in the curriculum)
- PLO 4: develop appropriate action plans for transforming ideas into start-up companies (by means of coursework, tutorial classes and training in his/her internship in the curriculum)
- PLO 5: effectively collaborate with team members with different expertise and communicate their ideas to a range of audiences during the entrepreneurial process (by means of coursework, tutorial classes and training in his/her internship in the curriculum)

Impermissible Combinations:

NII

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Core Courses (12 credits)

(Resource, Management and Basic Entrepreneurship)
ENTR2001 Professional and leadership development (6)
IIMT1611 Principles of Technology Entrepreneurship (6)

2. Advanced level courses (24 credits) Disciplinary Core Courses (24 credits)

(Creativity and Innovation)

ENTR3001 Science-based innovation development (6)
ENTR3002 Customer analysis and strategic marketing (6)

(Practical Experience)

ENTR4966 Entrepreneurship internship (6)
ENTR4999 Entrepreneurship project (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students may consider taking the following courses if they wish to pursue a more focused study in topics related to entrepreneurship:BUSI38011 Business Law, BUSI3803 Company Law, STRA3706 China Business Environment.
- 3. Courses with the prefix ENTR are subjected to minor changes.
- 4. Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Remarks:

Minor Title Minor in Science Entrepreneurship 2019

Offered to students

admitted to Year 1 in

Objectives:

This Minor aims at broadening the horizon of our undergraduate students with respect to entrepreneurship, so as to arouse their interest in this aspect and better equip them. It is also important for our students to visualize how their training in science (a) is relevant to the real world and (b) can bring about huge insights via critical analysis of the operation of existing enterprises. With the vivid commercial environment and a growing atmosphere for start-ups both locally and globally, this Minor also serves to offer more competitive edge to our students via connecting their academic knowledge with the real world, even though they may not initiate their own start-ups in the short run.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the entrepreneurial process and the principles/models relevant to its different key stages (by means of coursework and tutorial classes in the curriculum)
- PLO 2: gain insights into how a broad range of disciplines contribute to the success of the entrepreneurial process (by means of coursework and tutorial classes in the curriculum)
- PLO 3: evaluate how scientific knowledge can cause impact to the society via entrepreneurship (by means of coursework and tutorial classes in the curriculum)
- PLO 4: develop appropriate action plans for transforming ideas into start-up companies (by means of coursework, tutorial classes and training in his/her internship in the curriculum)
- PLO 5: effectively collaborate with team members with different expertise and communicate their ideas to a range of audiences during the entrepreneurial process (by means of coursework, tutorial classes and training in his/her internship in the curriculum)

Impermissible Combinations:

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Core Courses (12 credits)

(Resource, Management and Basic Entrepreneurship) Professional and leadership development (6) ENTR2001 Principles of Technology Entrepreneurship (6) **IIMT1611**

2. Advanced level courses (24 credits)

Disciplinary Core Courses (24 credits)

(Creativity and Innovation)

ENTR3001 Science-based innovation development (6) Customer analysis and strategic marketing (6) FNTR3002

(Practical Experience)

Entrepreneurship internship (6) ENTR4966 ENTR4999 Entrepreneurship project (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses
- 2. Students may consider taking the following courses if they wish to pursue a more focused study in topics related to entrepreneurship: BUSI38011 Business Law, BUSI3803 Company Law, STRA3706 China Business Environment.
- 3. Courses with the prefix ENTR are subjected to minor changes.
- 4. Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Remarks:

Minor Title Minor in Science Entrepreneurship

Offered to students 2018

admitted to Year 1 in

Objectives:

This Minor aims at broadening the horizon of our undergraduate students with respect to entrepreneurship, so as to arouse their interest in this aspect and better equip them. It is also important for our students to visualize how their training in science (a) is relevant to the real world and (b) can bring about huge insights via critical analysis of the operation of existing enterprises. With the vivid commercial environment and a growing atmosphere for start-ups both locally and globally, this Minor also serves to offer more competitive edge to our students via connecting their academic knowledge with the real world, even though they may not initiate their own start-ups in the short run.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the entrepreneurial process and the principles/models relevant to its different key stages (by means of coursework and tutorial classes in the curriculum)
- PLO 2: gain insights into how a broad range of disciplines contribute to the success of the entrepreneurial process (by means of coursework and tutorial classes in the curriculum)
- PLO 3: evaluate how scientific knowledge can cause impact to the society via entrepreneurship (by means of coursework and tutorial classes in the curriculum)
- PLO 4: develop appropriate action plans for transforming ideas into start-up companies (by means of coursework, tutorial classes and training in his/her internship in the curriculum)
- PLO 5: effectively collaborate with team members with different expertise and communicate their ideas to a range of audiences during the entrepreneurial process (by means of coursework, tutorial classes and training in his/her internship in the curriculum)

Impermissible Combinations:

NII

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Core Courses (12 credits)

(Resource, Management and Basic Entrepreneurship)
ENTR2001 Professional and leadership development (6)
IIMT1611 Principles of Technology Entrepreneurship (6)

2. Advanced level courses (24 credits) Disciplinary Core Courses (24 credits)

(Creativity and Innovation)

ENTR3001 Science-based innovation development (6)
ENTR3002 Customer analysis and strategic marketing (6)

(Practical Experience)

ENTR4966 Entrepreneurship internship (6)
ENTR4999 Entrepreneurship project (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students may consider taking the following courses if they wish to pursue a more focused study in topics related to entrepreneurship:BUSI38011 Business Law, BUSI3803 Company Law, STRA3706 China Business Environment.
- 3. Courses with the prefix ENTR are subjected to minor changes.
- 4. Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Remarks:

Minor Title Minor in Science Entrepreneurship

Offered to students 2017

admitted to Year 1 in

Objectives:

This Minor aims at broadening the horizon of our undergraduate students with respect to entrepreneurship, so as to arouse their interest in this aspect and better equip them. It is also important for our students to visualize how their training in science (a) is relevant to the real world and (b) can bring about huge insights via critical analysis of the operation of existing enterprises. With the vivid commercial environment and a growing atmosphere for start-ups both locally and globally, this Minor also serves to offer more competitive edge to our students via connecting their academic knowledge with the real world, even though they may not initiate their own start-ups in the short run.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the entrepreneurial process and the principles/models relevant to its different key stages (by means of coursework and tutorial classes in the curriculum)
- PLO 2: gain insights into how a broad range of disciplines contribute to the success of the entrepreneurial process (by means of coursework and tutorial classes in the curriculum)
- PLO 3: evaluate how scientific knowledge can cause impact to the society via entrepreneurship (by means of coursework and tutorial classes in the curriculum)
- PLO 4: develop appropriate action plans for transforming ideas into start-up companies (by means of coursework, tutorial classes and training in his/her internship in the curriculum)
- PLO 5: effectively collaborate with team members with different expertise and communicate their ideas to a range of audiences during the entrepreneurial process (by means of coursework, tutorial classes and training in his/her internship in the curriculum)

Impermissible Combinations:

NII

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Core Courses (12 credits)

(Resource, Management and Basic Entrepreneurship)
ENTR2001 Professional and leadership development (6)
IIMT1611 Principles of Technology Entrepreneurship (6)

2. Advanced level courses (24 credits) Disciplinary Core Courses (24 credits)

(Creativity and Innovation)

ENTR3001 Science-based innovation development (6)
ENTR3002 Customer analysis and strategic marketing (6)

(Practical Experience)

ENTR4966 Entrepreneurship internship (6)
ENTR4999 Entrepreneurship project (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.
- 2. Students may consider taking the following courses if they wish to pursue a more focused study in topics related to entrepreneurship:BUSI38011 Business Law, BUSI3803 Company Law, STRA3706 China Business Environment.
- 3. Courses with the prefix ENTR are subjected to minor changes.
- 4. Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Remarks:

Minor Title Minor in Science Entrepreneurship 2016

Offered to students

admitted to Year 1 in

Objectives:

This Minor aims at broadening the horizon of our undergraduate students with respect to entrepreneurship, so as to arouse their interest in this aspect and better equip them. It is also important for our students to visualize how their training in science (a) is relevant to the real world and (b) can bring about huge insights via critical analysis of the operation of existing enterprises. With the vivid commercial environment and a growing atmosphere for start-ups both locally and globally, this Minor also serves to offer more competitive edge to our students via connecting their academic knowledge with the real world, even though they may not initiate their own start-ups in the short run.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: apprehend the entrepreneurial process and the principles/models relevant to its different key stages (by means of coursework and tutorial classes in the curriculum)
- PLO 2: gain insights into how a broad range of disciplines contribute to the success of the entrepreneurial process (by means of coursework and tutorial classes in the curriculum)
- PLO 3: evaluate how scientific knowledge can cause impact to the society via entrepreneurship (by means of coursework and tutorial classes in the curriculum)
- PLO 4: develop appropriate action plans for transforming ideas into start-up companies (by means of coursework, tutorial classes and training in his/her internship in the curriculum)
- PLO 5: effectively collaborate with team members with different expertise and communicate their ideas to a range of audiences during the entrepreneurial process (by means of coursework, tutorial classes and training in his/her internship in the curriculum)

Impermissible Combinations:

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Core Courses (12 credits)

(Resource, Management and Basic Entrepreneurship) Professional and leadership development (6) ENTR2001 Principles of Technology Entrepreneurship (6) **IIMT1611**

2. Advanced level courses (24 credits) **Disciplinary Core Courses (24 credits)**

(Creativity and Innovation)

ENTR3001 Science-based innovation development (6) Customer analysis and strategic marketing (6) FNTR3002

(Practical Experience)

Entrepreneurship internship (6) **ENTR4966** ENTR4999 Entrepreneurship project (6)

Notes:

- 1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses
- 2. Students may consider taking the following courses if they wish to pursue a more focused study in topics related to entrepreneurship:BUSI38011 Business Law, BUSI3803 Company Law, STRA3706 China Business Environment.
- 3. Courses with the prefix ENTR are subjected to minor changes.
- 4. Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Remarks:

Minor Title Minor in Statistics

Offered to students

admitted to Year 1 in

Objectives:

The curriculum of the Minor in Statistics is structured specifically to cater for the general need of non-statistical disciplines and provide basic training in statistical methodologies and their applications to practical problems. It aims to provide students with a strong and rigorous sense of quantitative reasoning that has become an indispensable skill in nearly all disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

2020

- PLO 1: acquire basic statistical knowledge alongside their major disciplines, with emphases on correct applications of statistical methods and insightful interpretations of statistical findings (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: equip with computational skills essential to conducting complete data analyses (by means of coursework, tutorial classes, project-based learning and presentation opportunities in the curriculum)
- PLO 3: participate proactively in large-scale, multi-disciplinary studies, determine objective findings, and provide guidance on all aspects of data collection and analyses (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Major in Statistics

List A

Minor in Risk Management

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

STAT1601 Elementary statistical methods (6) STAT1602 Business statistics (6) STAT1603 Introductory statistics (6) Probability and statistics I (6) STAT2601 List B STAT2602 Probability and statistics II (6)

STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

STAT2605 Demographic and socio-economic statistics (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

Linear statistical analysis (6) STAT3600 Statistical inference (6) STAT3602 STAT3603 Stochastic processes (6)

Design and analysis of experiments (6) STAT3604 STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

Statistics in clinical medicine and bio-medical research (6) STAT3607

Multivariate data analysis (6)

STAT3608 Statistical genetics (6)

Computer-aided data analysis (6) STAT3611 Statistical machine learning (6) STAT3612 Marketing analytics (6) STAT3613 Business forecasting (6) STAT3614 Sample survey methods (6) STAT3617 Modern nonparametric statistics (6) STAT3620 STAT3621 Statistical data analysis (6) STAT3655 Survival analysis (6) STAT4601 Time-series analysis (6)

Notes:

STAT4602

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Minor Title Minor in Statistics

Offered to students

2019

admitted to Year 1 in

Objectives:

The curriculum of the Minor in Statistics is structured specifically to cater for the general need of non-statistical disciplines and provide basic training in statistical methodologies and their applications to practical problems. It aims to provide students with a strong and rigorous sense of quantitative reasoning that has become an indispensable skill in nearly all disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: acquire basic statistical knowledge alongside their major disciplines, with emphases on correct applications of statistical methods and insightful interpretations of statistical findings (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: equip with computational skills essential to conducting complete data analyses (by means of coursework, tutorial classes, project-based learning and presentation opportunities in the curriculum)
- PLO 3: participate proactively in large-scale, multi-disciplinary studies, determine objective findings, and provide guidance on all aspects of data collection and analyses (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Major in Statistics

Minor in Risk Management

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

List A	
STAT1601	Elementary statistical methods (6)
STAT1602	Business statistics (6)
STAT1603	Introductory statistics (6)
STAT2601	Probability and statistics I (6)
List B	
STAT2602	Probability and statistics II (6)
STATS603	Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

Demographic and socio-economic statistics (6) STAT2605

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses: Linear statistical analysis (6) STAT3600

Statistical inference (6) STAT3602 STAT3603 Stochastic processes (6) Design and analysis of experiments (6) STAT3604 STAT3605 Quality control and management (6) STAT3606 Business logistics (6) Statistics in clinical medicine and bio-medical research (6) STAT3607

STAT3608 Statistical genetics (6) Computer-aided data analysis (6) STAT3611 Statistical machine learning (6) STAT3612 Marketing analytics (6) STAT3613 Business forecasting (6) STAT3614 STAT3617 Sample survey methods (6) Modern nonparametric statistics (6) STAT3620

STAT3621 Statistical data analysis (6) Survival analysis (6) STAT3655

STAT3955 Survival analysis (6) Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie. Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6)

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc svllabuses.

Remarks:

Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Minor Title Minor in Statistics

Offered to students

admitted to Year 1 in

Objectives:

The curriculum of the Minor in Statistics is structured specifically to cater for the general need of non-statistical disciplines and provide basic training in statistical methodologies and their applications to practical problems. It aims to provide students with a strong and rigorous sense of quantitative reasoning that has become an indispensable skill in nearly all disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

2018

- PLO 1: acquire basic statistical knowledge alongside their major disciplines, with emphases on correct applications of statistical methods and insightful interpretations of statistical findings (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: equip with computational skills essential to conducting complete data analyses (by means of coursework, tutorial classes, project-based learning and presentation opportunities in the curriculum)
- PLO 3: participate proactively in large-scale, multi-disciplinary studies, determine objective findings, and provide guidance on all aspects of data collection and analyses (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Major in Statistics

List A

Minor in Risk Management

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

STAT1601 Elementary statistical methods (6) STAT1602 Business statistics (6) STAT1603 Introductory statistics (6) Probability and statistics I (6) STAT2601 List B STAT2602 Probability and statistics II (6)

STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

STAT2605 Demographic and socio-economic statistics (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses: Linear statistical analysis (6) STAT3600

Statistical inference (6) STAT3602 STAT3603 Stochastic processes (6)

Design and analysis of experiments (6) STAT3604 STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

Statistics in clinical medicine and bio-medical research (6) STAT3607

STAT3608 Statistical genetics (6)

Computer-aided data analysis (6) STAT3611 Statistical machine learning (6) STAT3612 [previous title: Data mining (6)] STAT3613 Marketing analytics (6) [previous title: Marketing engineering (6)]

Business forecasting (6) STAT3614 STAT3617 Sample survey methods (6) Modern nonparametric statistics (6) STAT3620

STAT3621 Statistical data analysis (6) Survival analysis (6) STAT3655

STAT3955

Survival analysis (6)

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6) Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or

STAT3955 are mutually exclusvie.

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc svllabuses.

Remarks:

Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Minor Title Minor in Statistics

Offered to students

admitted to Year 1 in

Objectives:

The curriculum of the Minor in Statistics is structured specifically to cater for the general need of non-statistical disciplines and provide basic training in statistical methodologies and their applications to practical problems. It aims to provide students with a strong and rigorous sense of quantitative reasoning that has become an indispensable skill in nearly all disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

2017

- PLO 1: acquire basic statistical knowledge alongside their major disciplines, with emphases on correct applications of statistical methods and insightful interpretations of statistical findings (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: equip with computational skills essential to conducting complete data analyses (by means of coursework, tutorial classes, project-based learning and presentation opportunities in the curriculum)
- PLO 3: participate proactively in large-scale, multi-disciplinary studies, determine objective findings, and provide guidance on all aspects of data collection and analyses (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Major in Statistics

List A

Minor in Risk Management

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

STAT1601 Elementary statistical methods (6)
STAT1602 Business statistics (6)
STAT1603 Introductory statistics (6)
STAT2601 Probability and statistics I (6)
List B
STAT2602 Probability and statistics II (6)

STAT2602 Probability and statistics if (6)
STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

(6)

STAT2605 Demographic and socio-economic statistics (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credit	s selected from the following courses:
STAT3600	Linear statistical analysis (6)

STAT3602 Statistical inference (6)
STAT3603 Stochastic processes (6)

STAT3604 Design and analysis of experiments (6) STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

STAT3607 Statistics in clinical medicine and bio-medical research (6)

STAT3608 Statistical genetics (6)

STAT3611 Computer-aided data analysis (6)
STAT3612 Statistical machine learning (6)
STAT3613 Marketing analytics (6)

STAT3614 Business forecasting (6)
STAT3616 Advanced SAS programming (6)
STAT3617 Sample survey methods (6)
STAT3620 Modern nonparametric statistics (6)

STAT3621 Statistical data analysis (6) STAT3655 Survival analysis (6)

STAT3955 Survival analysis (6)

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6)

-4--

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

[previous title: Data mining (6)]

[previous title: Marketing engineering (6)]

Take either STAT3655 or STAT3955 to fulfill

the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie. Take either STAT3655 or STAT3955 to fulfill

the requirement; but not both. STAT3655 or STAT3955 are mutually exclusvie.

Remarks:
Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Minor Title Minor in Statistics

Offered to students

admitted to Year 1 in

Objectives:

The curriculum of the Minor in Statistics is structured specifically to cater for the general need of non-statistical disciplines and provide basic training in statistical methodologies and their applications to practical problems. It aims to provide students with a strong and rigorous sense of quantitative reasoning that has become an indispensable skill in nearly all disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

2016

- PLO 1: acquire basic statistical knowledge alongside their major disciplines, with emphases on correct applications of statistical methods and insightful interpretations of statistical findings (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: equip with computational skills essential to conducting complete data analyses (by means of coursework, tutorial classes, project-based learning and presentation opportunities in the curriculum)
- PLO 3: participate proactively in large-scale, multi-disciplinary studies, determine objective findings, and provide guidance on all aspects of data collection and analyses (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Major in Statistics

Minor in Risk Management

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B: List A STAT1601 Elementary statistical methods (6) STAT1602 Business statistics (6) STAT1603 Introductory statistics (6) Probability and statistics I (6) STAT2601 List B STAT2602 Probability and statistics II (6) STAT2603 Data management with SAS (6) STAT2604 Introduction to R programming and elementary data analysis STAT2605 Demographic and socio-economic statistics (6)

2. Advanced level courses (30 credits)

L. Advanced level	courses (ou creates)	
Disciplinary Electi	ves (30 credits)	
At least 30 credit	's selected from the following courses:	
STAT3600	Linear statistical analysis (6)	
STAT3602	Statistical inference (6)	
STAT3603	Stochastic processes (6)	
STAT3604	Design and analysis of experiments (6)	
STAT3605	Quality control and management (6)	
STAT3606	Business logistics (6)	
STAT3607	Statistics in clinical medicine and bio-medical research (6)	
STAT3608	Statistical genetics (6)	
STAT3611	Computer-aided data analysis (6)	
STAT3612	Statistical machine learning (6)	[previous title: Data mining (6)]
STAT3613	Marketing analytics (6)	[previous title: Marketing engineering (6)]
STAT3614	Business forecasting (6)	
STAT3616	Advanced SAS programming (6)	
STAT3617	Sample survey methods (6)	
STAT3620	Modern nonparametric statistics (6)	
STAT3621	Statistical data analysis (6)	
STAT3655	Survival analysis (6)	Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or STAT3055 are mutually exclusive.

STAT3955 are mutually exclusvie. Take either STAT3655 or STAT3955 to fulfill Survival analysis (6) STAT3955

the requirement: but not both. STAT3655 or STAT3955 are mutually exclusvie.

STAT4601 Time-series analysis (6) Multivariate data analysis (6) STAT4602

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:
Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Minor Title Minor in Statistics

Offered to students

admitted to Year 1 in

Objectives:

The curriculum of the Minor in Statistics is structured specifically to cater for the general need of non-statistical disciplines and provide basic training in statistical methodologies and their applications to practical problems. It aims to provide students with a strong and rigorous sense of quantitative reasoning that has become an indispensable skill in nearly all disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

2015

- PLO 1: acquire basic statistical knowledge alongside their major disciplines, with emphases on correct applications of statistical methods and insightful interpretations of statistical findings (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: equip with computational skills essential to conducting complete data analyses (by means of coursework, tutorial classes, project-based learning and presentation opportunities in the curriculum)
- PLO 3: participate proactively in large-scale, multi-disciplinary studies, determine objective findings, and provide guidance on all aspects of data collection and analyses (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Major in Statistics

List A

Minor in Risk Management

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

STAT1601 Elementary statistical methods (6)
STAT1602 Business statistics (6)
STAT1603 Introductory statistics (6)
STAT2601 Probability and statistics I (6)
List B
STAT2602 Probability and statistics II (6)

STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

(6)

STAT2605 Demographic and socio-economic statistics (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses: STAT3600 Linear statistical analysis (6)

STAT3602 Statistical inference (6)
STAT3603 Stochastic processes (6)

STAT3604 Design and analysis of experiments (6) STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

STAT3607 Statistics in clinical medicine and bio-medical research (6)

STAT3608 Statistical genetics (6)

STAT3611 Computer-aided data analysis (6)
STAT3612 Statistical machine learning (6)
STAT3613 Marketing analytics (6)

STAT3614 Business forecasting (6)
STAT3616 Advanced SAS programming (6)
STAT3617 Sample survey methods (6)
STAT3620 Modern nonparametric statistics (6)

STAT3621 Statistical data analysis (6) STAT3655 Survival analysis (6)

STAT3955 Survival analysis (6)

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6) Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or

STAT3955 are mutually exclusvie. Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or

STAT3955 are mutually exclusvie.

[previous title: Data mining (6)]

[previous title: Marketing engineering (6)]

Notes:

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:
Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Minor Title Minor in Statistics

Offered to students admitted to Year 1 in

2014

Objectives:

The curriculum of the Minor in Statistics is structured specifically to cater for the general need of non-statistical disciplines and provide basic training in statistical methodologies and their applications to practical problems. It aims to provide students with a strong and rigorous sense of quantitative reasoning that has become an indispensable skill in nearly all disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: acquire basic statistical knowledge alongside their major disciplines, with emphases on correct applications of statistical methods and insightful interpretations of statistical findings (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: equip with computational skills essential to conducting complete data analyses (by means of coursework, tutorial classes, project-based learning and presentation opportunities in the curriculum)
- PLO 3: participate proactively in large-scale, multi-disciplinary studies, determine objective findings, and provide guidance on all aspects of data collection and analyses (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Computing and Data Analytics

Major in Decision Analytics

Major in Risk Management

Major in Statistics

Minor in Risk Management

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B: List A

STAT1601 Elementary statistical methods (6) STAT1602 Business statistics (6) STAT1603 Introductory statistics (6) Probability and statistics I (6) STAT2601 List B STAT2602 Probability and statistics II (6)

STAT2603 Data management with SAS (6)

Introduction to R programming and elementary data analysis STAT2604

STAT2605 Demographic and socio-economic statistics (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credit	s selected from the following courses:
STAT3600	Linear statistical analysis (6)

Statistical inference (6) STAT3602 STAT3603 Stochastic processes (6)

STAT3604 Design and analysis of experiments (6) STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

Statistics in clinical medicine and bio-medical research (6) STAT3607

STAT3608 Statistical genetics (6)

Computer-aided data analysis (6) STAT3611 Statistical machine learning (6) STAT3612 Marketing analytics (6) STAT3613

Business forecasting (6) STAT3614 STAT3616 Advanced SAS programming (6) Sample survey methods (6) STAT3617 STAT3620 Modern nonparametric statistics (6)

Statistical data analysis (6) STAT3621 Survival analysis (6) STAT3655

Survival analysis (6) STAT3955

STAT4601 Time-series analysis (6) Multivariate data analysis (6) STAT4602

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both, STAT3655 or STAT3955 are mutually exclusvie. Take either STAT3655 or STAT3955 to fulfill the requirement: but not both. STAT3655 or

[previous title: Marketing engineering (6)]

STAT3955 are mutually exclusvie.

[previous title: Data mining (6)]

^{1.} Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:
Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Minor Title Minor in Statistics

Offered to students

admitted to Year 1 in

Objectives:

The curriculum of the Minor in Statistics is structured specifically to cater for the general need of non-statistical disciplines and provide basic training in statistical methodologies and their applications to practical problems. It aims to provide students with a strong and rigorous sense of quantitative reasoning that has become an indispensable skill in nearly all disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

2013

- PLO 1: acquire basic statistical knowledge alongside their major disciplines, with emphases on correct applications of statistical methods and insightful interpretations of statistical findings (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: equip with computational skills essential to conducting complete data analyses (by means of coursework, tutorial classes, project-based learning and presentation opportunities in the curriculum)
- PLO 3: participate proactively in large-scale, multi-disciplinary studies, determine objective findings, and provide guidance on all aspects of data collection and analyses (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Decision Analytics

Major in Risk Management

Major in Statistics

Minor in Risk Management

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

List A

STAT1601 Elementary statistical methods (6)
STAT1602 Business statistics (6)
STAT1603 Introductory statistics (6)
STAT2601 Probability and statistics I (6)

List B

STAT2602 Probability and statistics II (6) STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

(6)

STAT2605 Demographic and socio-economic statistics (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

STAT3600 Linear statistical analysis (6) STAT3602 Statistical inference (6) STAT3603 Stochastic processes (6)

STAT3604 Design and analysis of experiments (6) STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

STAT3607 Statistics in clinical medicine and bio-medical research (6)

STAT3608 Statistical genetics (6)

STAT3611 Computer-aided data analysis (6)
STAT3612 Statistical machine learning (6)
STAT3613 Marketing analytics (6)

STAT3614 Business forecasting (6)
STAT3616 Advanced SAS programming (6)
STAT3617 Sample survey methods (6)
STAT3620 Modern nonparametric statistics (6)

STAT3620 Modern nonparametric stat STAT3621 Statistical data analysis (6)

STAT3655 Survival analysis (6)

STAT3955 Survival analysis (6)

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6) [previous title: Data mining (6)]
[previous title: Marketing engineering (6)]

Take either STAT3655 or STAT3955 to fulfill

the requirement; but not both. STAT3655 or STAT3955 are mutually exclusive.

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or

STAT3955 are mutually exclusvie.

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Minor Title Minor in Statistics

Offered to students

2012

admitted to Year 1 in

Objectives:

The curriculum of the Minor in Statistics is structured specifically to cater for the general need of non-statistical disciplines and provide basic training in statistical methodologies and their applications to practical problems. It aims to provide students with a strong and rigorous sense of quantitative reasoning that has become an indispensable skill in nearly all disciplines.

Learning Outcomes:

By the end of this programme, students should be able to:

- PLO 1: acquire basic statistical knowledge alongside their major disciplines, with emphases on correct applications of statistical methods and insightful interpretations of statistical findings (by means of coursework, tutorial classes and project-based learning in the curriculum)
- PLO 2: equip with computational skills essential to conducting complete data analyses (by means of coursework, tutorial classes, project-based learning and presentation opportunities in the curriculum)
- PLO 3: participate proactively in large-scale, multi-disciplinary studies, determine objective findings, and provide guidance on all aspects of data collection and analyses (by means of coursework, tutorial classes and project-based learning in the curriculum)

Impermissible Combinations:

Major in Decision Analytics

Major in Risk Management

Major in Statistics

Minor in Risk Management

Required courses (42 credits)

1. Introductory level courses (12 credits)

Disciplinary Electives (12 credits)

At least 12 credits from List A and List B, with at least 6 credits from List B:

List A

STAT1601 Elementary statistical methods (6)
STAT1602 Business statistics (6)
STAT1603 Introductory statistics (6)
STAT2601 Probability and statistics I (6)

List B

STAT2602 Probability and statistics II (6) STAT2603 Data management with SAS (6)

STAT2604 Introduction to R programming and elementary data analysis

(6)

STAT2605 Demographic and socio-economic statistics (6)

2. Advanced level courses (30 credits)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

STAT3600 Linear statistical analysis (6) STAT3602 Statistical inference (6) STAT3603 Stochastic processes (6)

STAT3604 Design and analysis of experiments (6) STAT3605 Quality control and management (6)

STAT3606 Business logistics (6)

STAT3607 Statistics in clinical medicine and bio-medical research (6)

STAT3608 Statistical genetics (6)

STAT3611 Computer-aided data analysis (6)
STAT3612 Statistical machine learning (6)
STAT3613 Maddeling analytics (6)

STAT3613 Marketing analytics (6)
STAT3614 Business forecasting (6)
STAT3616 Advanced SAS programming (6)
STAT3617 Sample survey methods (6)
STAT3620 Modern nonparametric statistics (6)

STAT3621 Statistical data analysis (6) STAT3655 Survival analysis (6)

STAT3955 Survival analysis (6)

STAT4601 Time-series analysis (6) STAT4602 Multivariate data analysis (6) [previous title: Data mining (6)]
[previous title: Marketing engineering (6)]

Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or

STAT3955 are mutually exclusvie. Take either STAT3655 or STAT3955 to fulfill the requirement; but not both. STAT3655 or

STAT3955 are mutually exclusvie.

Notes:

1. Double counting of credits is not permissible for major-minor or double-minors combinations. For a course appears as a core course ("disciplinary core") in the major-minor or double-minors, students have to make up the credits by taking replacement course in the minor. For details, please refer to "Students taking double Majors, Major-Minor or double Minors with overlapping course requirements" in the BSc syllabuses.

Remarks:

Important! Ultimate responsibility rests with students to ensure that the required pre-requisites and co-requisite of selected courses are fulfilled. Students must take and pass all required courses in the selected primary science major in order to satisfy the degree graduation requirements.

Students taking double Majors,

Major-Minor or double Minors with overlapping course requirements

SCIENCE

SECTION VIII Students taking double Majors, Major-Minor or double Minors with overlapping course requirements

- 1. Double-counting of courses up to a maximum of 24 credits is permissible with double majors. The double-counted courses in both Science majors must include SCNC1111 and SCNC1112. Additional credits to be double-counted must be for courses required ('disciplinary core') by both majors. For cases with 24 or less double-counted credits, the student must make up an equivalent number of credits by taking other courses offered by any Faculty.
- 2. The following list shows the major-major combinations that have more than 24 credits of the same 'disciplinary core' courses that appear in both majors and is subject to the rule of double counting:

Major-Major combination	Admission Year (Year 1)	No. of common 'disciplinary core' courses (credits) appear in both majors including SCNC1111 and SCNC1112	No. of replacement courses (credits) to be taken in the 2 nd major ('Major 2')
Major in Astronomy Major in Physics	2015, 2016, 2017	5 (30 credits)	1 (6 credits)
Major in Biochemistry Major in Chemistry	All years	5 (30 credits)	1 (6 credits)
Major in Biochemistry Major in Molecular Biology & Biotechnology	2014	5 (30 credits)	1 (6 credits)
Major in Biological Sciences Major in Ecology & Biodiversity	All years	7 (42 credits)	3 (18 credits)
Major in Biological Sciences	2017, 2018, 2019	6 (36 credits)	2 (12 credits)
Major in Food & Nutritional Science	2015, 2016	7 (42 credits)	3 (18 credits)
Major in Biological Sciences Major in Molecular Biology & Biotechnology	All years	6 (36 credits)	2 (12 credits)
Major in Earth System Science Major in Geology	2015, 2016	5 (30 credits)	1 (6 credits)
Major in Ecology & Biodiversity	2017, 2018, 2019	5 (30 credits)	1 (6 credits)
Major in Food & Nutritional Science	2015, 2016	6 (36 credits)	2 (12 credits)
Major in Ecology & Biodiversity Major in Molecular Biology & Biotechnology	All years	5 (30 credits)	1 (6 credits)
Major in Food & Nutritional Science Major in Molecular Biology & Biotechnology	All years	6 (36 credits)	2 (12 credits)

If more than 24 credits (including SCNC1111 & SCNC1112) are listed as 'disciplinary core' courses required in both the first ('Major 1') and second ('Major 2') majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) in the second major ('Major 2'). The replacement course(s) must be the disciplinary elective course in the second major ('Major 2') and have the same prefix and at the same or higher level as the double-counted course(s). The double counted credits should count the following courses in this order: (1) SCNC1111 and SCNC1112, (2) introductory level (levels 1 and 2) courses, and (3) advanced level (level 3 or above) courses. For example, if a student takes a first major in Ecology & Biodiversity ('Major 1') and the 2nd major in Molecular Biology & Biotechnology ('Major 2'), SCNC1111, SCNC1112, BIOL1110, BIOL2102 and BIOL2103 are the common 'disciplinary core' courses that appear in both majors. The first 3 courses SCNC1111, SCNC1112, and BIOL1110 would first be counted plus either BIOL2102 or BIOL2103 for the major in Molecular Biology & Biotechnology. The student has to take a replacement 'disciplinary elective' course (with a prefix of BIOL at level 2 or above) in the 2nd major in Molecular Biology & Biotechnology to make up for BIOL2102 or BIOL2103.

3. Starting from this academic year, candidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the following qualifications are exempted from taking SCNC1111:

- Level 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education (HKDSE)
- Level 5 or above in Mathematics Higher Level in International Baccalaureate (IB)
- Grade B or above in Mathematics and Further Mathematics in General Certificate of Education Advanced Level (GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

It is optional for them to take the course SCNC1111. Those who do not take this course should take a 6-credit disciplinary elective course of the science major in lieu.

The eligible students will be informed by the Faculty, via email, of the granting of an exemption from taking SCNC1111 in late August (before the start of your first year of study). You (as an eligible student) can try out courses that suit your academic interest before you commit to a particular major and submit your application form for taking a replacement course for SCNC1111 during the courses add/drop periods in your second/third year of study. The replacement course must be the disciplinary elective in your declared Science major. If you wish to take double Science majors, you should take the disciplinary elective in each of your declared Science majors to replace the course SCNC1111.

Under these circumstances, the following list shows the major-major combinations that have 24 credits (or more) of the same 'disciplinary core' courses that appear in both Science majors and is subject to the rule of double counting:

f Major Combination o r e	Admission Year (Year 1)	Exemption granted	No. of replacement courses (credits) to be taken in the 1 st major ('Major 1')	No. of common 'disciplinary core' courses (credits) appear in both Science majors including SCNC1111 and SCNC1112	No. of replacement courses (credits) to be taken in the 2 nd major ('Major 2')
Major in Biochemistry Major in Chemistry	2020	SCNC1111	1 (6 credits)	5 (30 credits)	1 (6 credits)
Major in B ⁸ ochemistry Major in Molecular Biology & Biotechnology	2020	SCNC1111	1 (6 credits)	4 (24 credits)	1 (6 credits) - to replace SCNC1111
Major in Biological Sciences Major in Ecology & Biodiversity	2020	SCNC1111	1 (6 credits)	7 (42 credits)	3 (18 credits)
Major in Biological Sciences Major in Fbod & Nutritional Science e	2020	SCNC1111	1 (6 credits)	6 (36 credits)	2 (12 credits)
Major in Biological Sciences Major in Molecular Biology & Biotechnology	2020	SCNC1111	1 (6 credits)	6 (36 credits)	2 (12 credits)
Major in Earth System Science Major in Geology	2020	SCNC1111	1 (6 credits)	4 (24 credits)	1 (6 credits) - to replace SCNC1111
Major in Ecology & Biodiversity Major in Food & Nutritional Science	2020	SCNC1111	1 (6 credits)	5 (30 credits)	1 (6 credits)
Major in Ecology & Biodiversity Major in Molecular Biology & Biotechnology	2020	SCNC1111	1 (6 credits)	5 (30 credits)	1 (6 credits)
Major in Food & Nutritional Science Major in Molecular Biology & Biotechnology	2020	SCNC1111	1 (6 credits)	6 (36 credits)	2 (12 credits)

If more than 24 credits (including SCNC1111 & SCNC1112) are listed as required courses ('disciplinary core') in both the first ('Major 1') and second ('Major 2') majors undertaken by a student, the student must make up the number of credits above the 24 permissible by taking replacement course(s) in the second major ('Major 2'). The replacement course(s) must be the disciplinary elective course(s) in the second major ('Major 2') and have the same prefix and at the same or higher level as the double-counted course(s). In light of the exempted course <u>SCNC1111</u>, the double counted credits should count the following courses in this order: (1) SCNC1112, (2) introductory

level (levels 1 and 2) courses, and (3) advanced level (level 3 or above) courses. For example, if a student takes a first major in Ecology & Biodiversity ('Major 1') and a second major in Molecular Biology & Biotechnology ('Major 2'), SCNC1111, SCNC1112, BIOL1110, BIOL2102 and BIOL2103 are the common 'disciplinary core' courses that appear in both majors. The 4 courses (SCNC1112, BIOL1110, BIOL2102, and BIOL2103) would be counted for the major in Molecular Biology & Biotechnology. The student has to take a replacement 'disciplinary elective' course in the second major in Molecular Biology & Biotechnology to make up for SCNC1111.

- 4. Double counting of credits is not permissible for major–minor or double-minors combinations. When a course is required ('disciplinary core') both by the major and minor or by both minors, the student must take a replacement course for the minor. The replacement course must be the disciplinary elective in the minor and have the same prefix and at the same or higher level as the course to be replaced.
- 5. For students taking the Mathematics related majors/minors should note the following exemption and replacement arrangement:

Students who fall into the following exemption situation for the introductory level Disciplinary Core Mathematics courses in Science Majors/Minors are required to take the specified replacement course(s) as prescribed in the table:

Exempted Course	Exemption granted under the following circumstances	Specified Replacement Course	
	For students taking Minor with an overlap of Disciplinary Core Course :		
	MATH1013	Select 6 credits from the following to replace MATH1013:	
	For students taking Programme / Major / Minor with Disciplinary Core Courses :	Any 6-credit level 2 or above Mathematics Disciplinary Elective chosen from the Programme/Major/Minor structure in which MATH1013 is the disciplinary core course	
MATH1013 University mathematics II	MATH1851 and MATH1853 (which are together deemed equivalent to MATH1013)	MATH2012 Fundamental concepts of mathematics (6) (if not the disciplinary core course in the structure)	
	For students taking Professional Core in Bachelor of Science in Actuarial Science with Disciplinary Core Course :	MATH2241 Introduction to mathematical analysis (6) (if not the disciplinary core course in the structure)	
	MATH1821 (which is equivalent to MATH1013)		
MATH2014 Multivariable calculus and	For students taking Programme/Major with Disciplinary Core Course : MATH2101 and MATH2211 (which are together deemed equivalent to MATH2014)	Select 6 credits from the following to replace MATH2014: • Any 6-credit level 2 or above Mathematics Disciplinary Elective chosen from the Programme/Major/Minor structure in which MATH2014 is the disciplinary core course	
Multivariable calculus and linear algebra	For students taking Professional Core in Bachelor of Science in Actuarial Science with Disciplinary Core Course : MATH2822 (which is equivalent to MATH2014)	MATH2012 Fundamental concepts of mathematics (6) (if not the disciplinary core course in the structure) MATH2241 Introduction to mathematical analysis (6) (if not the disciplinary core course in the structure)	

6. For the situations of 2, 3, 4 and 5 above, students have to complete and submit the online application form to the Faculty Office via the <u>Science Online Application Submission System (OASS)</u> by the deadline of course selection or add/drop periods. The application will then be forwarded to the relevant Course Selection Adviser (CSA) for endorsement and comment (if any).

Course Descriptions

SCIENCE

SECTION IX Course Descriptions

BIOC1600		ctives in biochem	nstry (6 credits)	Academic Yea					
Offering Department		cal Sciences		Quota					
ourse Co-ordinator			nces (jatanner@hku.hk)						
eachers Involved		Koon,Biomedical Scie							
		W Wong,Biomedical Scien							
	,	nner,Biomedical Scier	,						
		Y Ho,Biomedical Science Y Huen,Biomedical Science Scie							
ourse Objectives		(Dr. Y S Chan, Department of Paediatrics and Adolescent Medicine)							
ourse Objectives	 Teach students a biochemical perspective on each of the Basic Sciences focusing on concepts fundamental to the learning of Biochemistry. Promote deep learning of course material through an integrated programme of practical and collaborative tasks. Inspire students with a view of the great discoveries and future challenges for Biochemistry. Help students make the transition from school to university by developing their teamwork, independent study skills and confidence to communicate within a Biochemistry learning environment. 								
ourse Contents		emical Perspective on							
Topics	The elem		om carbon to Coenzyme A); Resonand (thinking in 3 dimensions); Isomerisr						
	universal	I biochemical solvent)	& buffer; Quantitation in chemistry (wh						
	The basi		life (proteins, DNA, lipids, carbohydrat ılar evolution); Origins of life (the chicke						
	C. Physics and Mathematics for Biochemistry Thermodynamics from a Biological Perspective; Introduction to molecular recognition and binding (DNA melting); Statistics for biochemistry (applied statistics for what you really need to know); Thinking numbers (exponentials, logs and the limits of life).								
	The prot	ing Biochemistry ein; The gene; Vitames and failures.	nins and disease; Synthetic biology; T	he challenges of modern-	day genetics Drug				
ourse Learning	On successful completion of this course, students should be able to:								
utcomes	CLO 1 describe the basics of biomolecular structure from a chemical perspective, thereby integrating the basic sciences of biology, chemistry and physics into a biochemical perspective								
	n	CLO 2 apply knowledge of biomolecular structure to review major discoveries and contemporary issues in molecular biology							
	S	CLO 3 critically scrutinize and interpret scientific data, and discuss major issues in biochemistry, using the scientific literature							
	CLO 4 demonstrate project management skills in working and collaborating together with colleagues in practicals and in presentation of scientific ideas CLO 5 relate how biochemistry intersects with other basic sciences and humanities in shaping our society								
ro_roquicitoe			•		•				
re-requisites and Co-requisites nd Impermissible ombinations)	equivaler		Biology, Chemistry, or Combined Scie	nce with blology of Chemi	stry component, o				
ffer in 2020 - 2021	Y 1s	st sem Offer in 2021	- 2022 : Y	Examination	Dec				
rade Descriptors	Α		formance demonstrating comprehensive unders						
(A+ to F)	В		scientific literature; superior presentation and gro monstrating full understanding of the subject ma		scientific data and the				
		scientific literature; goo	d presentation and group collaboration skills.						
	С		ce demonstrating adequate understanding of th		to use of scientific data				
	D		ure; some presentation and group collaboration s lemonstrating some understanding of basic sub-		scientific data and the				
	U		ted presentation and group collaboration skills.	of thatter, some ability to use	Scientific data and the				
	Fail		subject matter; with little to no insight into use of	scientific data; no understanding	of the scientific literature				
		and unable to present of	or collaborate.						
ourse Type		based course							
ourse Teaching	Activitie		Details		No. of Hours				
Learning Activities	Lectures		or workshops	36 12					
	Group w		Practical classess	·					
		/ Self study			50				
	Assessn	nent	Tasks and preparation		30				
ssessment Methods nd Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping				
	Assignm		including practical writeups	20	CLO 1,2,3,4,5				
	Examina	ation		50	CLO 1,2,3				
	Project r	reports	group communication project	30	CLO 2,3,4,5				
Required/recommended eading and	TBC								

BIOC2600	Basic biochemistry (6 credits)	Academic Year	2020
Offering Department	Biomedical Sciences	Quota	300
Course Co-ordinator	Dr. M Kotaka, Biomedical Sciences (masayo@hku.hk)		
Teachers Involved	(Dr A S L Wong,Biomedical Sciences) (Dr C M Qian,Biomedical Sciences) (Dr C W Lee,Biomedical Sciences)		

Cause Ohia-ti	(Dr. M Kotaka,Biomedical Sciences)							
Course Objectives	This course is designed to present an overview of biochemistry of fundamental importance to the life process. We aim to develop appreciation of the basics in biochemistry as a common ground for science and non-science students to progress into their areas of specialization. Students intending to pursue further studies in Biochemistry and Molecular Biology will find this course particularly helpful.							
Course Contents & Topics		basic bioenergetics; ke	oohydrates, lipids, nuclei ey metabolic processes ir					
Course Learning	On successful completion of this course, students should be able to:							
Outcomes			nctions of major biomolec					
			and significance of bioen			ar signaling		
			and importance of the flo					
	aı	nd/or lipids	nechanisms of disorders					
.			king and collaborating tog		es in group assig	nments		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOC1600 or BIOL1110 or ENGG1207 or BMED1207; and Not for students who have passed in BIOL2220 or MEDE2301 or BMED2301, or have already enrolled in thes courses.							
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2	2022 : Y		Examination	Dec		
Grade Descriptors (A+ to F)	A Demonstrates thorough and complete mastery of the entire range of knowledge and analytical skills as required for maximal attainment in all the course learning outcomes; excellence in critical thinking towards application of the knowledge in a range of contexts.							
	B Demonstrates substantial command of a broad range of knowledge and analytical skills as required for attainment of the majority of course learning outcomes; good evidence of critical thinking towards application of the knowledge in a range of contexts.							
	Demonstrates general but incomplete command of knowledge and analytical skills as required for attainment of adequate course learning outcomes; some evidence critical thinking towards application of the knowledge in a range of contexts.							
	D Demonstrates partial but limited command of knowledge and analytical skills as required for attainment of some of the course learning outcomes; limited evidence of critical thinking towards application of the knowledge in a range of contexts.							
	Fail Demonstrates little or no evidence of command of knowledge and analytical skills as required for attainment of the course learning outcomes; lacking in critical thinking towards application of the knowledge in a range of contexts.							
Course Type	Lecture-b	ased course						
Course Teaching	Activities	S	Details			No. of Hours		
& Learning Activities	Lectures					36		
	Tutorials					12		
	Reading	/ Self study				100		
Assessment Methods and Weighting	Methods		Details		ghting in final rse grade (%)	Assessment Methods to CLO Mapping		
	Assignments				40	CLO 1,2,3,4,5		
	Examinat				60	CLO 1,2,3,4		
Required/recommended reading and online materials								
Additional Course Information	Also offered as BMED2301 "Life Sciences I (Biochemistry)" to students of the Faculty of Engineering. Students who have passed BMED2301 (previously known as MEDE2301) is considered to have passed BIOC2600.							

BIOC3601	Basic n	metabo	olism (6 cre	dits)				Academic Year	2020
Offering Department	Biomedic	ical Scier	Sciences Quota 80						80
Course Co-ordinator	Dr N S Wong, Biomedical Sciences (nswong@hku.hk)								
Teachers Involved	(Dr N S V (Dr. L W	Wong,Ĕi √Lim,Bio	Biomedical S, iomedical Scien medical Scien medical Scien	ences) ´ nces)					
Course Objectives	some of applied to energy.	This course aims to provide foundation concepts of metabolism. It will enable students of this course to see how some of the basic concepts in biochemistry (specifically those learned in BIOC1600 and BIOC2600) could be applied to explain one of the most important and cardinal issues of biological life: the acquisition of metabolic energy. The course will lay the foundation for the more advanced courses offered in the Biochemistry Major and will also serve as a useful complement to courses on nutrition and dietetics.							
Course Contents & Topics	organism breakdow also be	This course focuses on the central metabolic pathways involved in the provision of energy needed by living organisms. Major metabolic pathways covered in this course include those that are involved in the synthesis and breakdown of glucose, glycogen, triacylglycerol, and amino acids. The metabolism of purines and pyrimidines will also be considered. Emphasis is on the understanding of the metabolic reactions involved and how they are regulated in relation to environmental cues. Metabolic derangements as a basis of diseases will also be discussed.							
Course Learning	On succe	cessful co	ompletion of the	nis course,	students s	nould be able	e to:		
Outcomes		CLO 1 achieve a vigorous intellectual appreciation of basic principles of functional organization of metabolic networks							
	CLO 2 identify one's own gaps of basic knowledge in metabolism and to fill up those gaps from literature resources through effective means or approaches								
	CLO 3 develop the communication and social skills essential for the acquisition and dissemination of knowledge								
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	BIOC260	00 or BIOL222	20 or MED	E2301 or B	MED2301			
Offer in 2020 - 2021	Y 1st	st sem	Offer in 2021	- 2022 : Y				Examination	Dec
Grade Descriptors (A+ to F)	Α	strong		and logical t	thinking and is	able to apply l		all the course learning de range of complex si	
	В	analyt						ourse learning outcome to complex situations.	
	C Demonstrates general but incomplete knowledge and skills required for attaining most of the course learning outcomes. Shows evidence of some analytical ability and logical thinking and is sometimes able to apply knowledge to familiar or uncomplicated								

	situations. Sor	metimes communicates ideas clearly.							
		Demonstrates limited knowledge and skills required for attaining some of the course learning outcomes. Shows poor a ability and logical thinking and is rarely able to apply knowledge to solve problems. Has difficulty in expressing ideas cohe							
			or no evidence of knowledge and skills required for attaining the course learning outcomes. Lacks analytical nking and is unable to apply knowledge to solve problems. Ineffective at communicating ideas.						
Course Type	Lecture-based course								
Course Teaching	Activities	Details		No. of Hours					
& Learning Activities	Lectures	glycolysis; gluconeogenesis; pen glycogen metabolis; lipid metabo metabolism; regulation and in pathways	lis; purine and pyrimidine	36					
	Tutorials	working on problems relating to t	working on problems relating to the lecture topics						
	Reading / Self study								
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping					
	Assignments		30	CLO 1,2,3					
	Examination	2.5 hrs examination	70	CLO 1,2,3					
Required/recommended reading and online materials	Devlin TM (2011) Text	., GJ Gatto Jr, Stryer L (2015) Biochemistry, 8 book of Biochemistry: with Clinical Correlation 017) Lehninger Principles of Biochemistry, 7tl	s, 7th ed. John Wiley & So	ns Inc, New York.					

BIOC3604	Essentia (6 credit	Academic Year	2020				
Offering Department	Biomedica	l Sciences			Quota	70	
Course Co-ordinator	Dr K M Ya	o, Biomedical S	ciences (kmyao@hku.hk)				
Teachers Involved	(Dr K M Y) (Dr N S W (Dr. R C C (Prof D K	Wong,Biomedical S ao,Biomedical S ong,Biomedical Chang,Biomed Y Shum,Biomed Zhou,Biomedica	ciences) Sciences) ical Sciences) ical Sciences)				
Course Objectives	To give students a general overview of different experimental approaches and model systems, and to provid students with hands-on experience in basic biochemical and molecular techniques.						
Course Contents & Topics	molecular, acids; sub	, genomic and o cellular fractiona	ental science; writing of lab noteboo others; methods for isolation and an ation; enzyme assays and spectropho tting and hybridization, cloning strate	alysis of carbo otometry; basic	hydrates, proteins, nucleic acid manipu	lipids and nucleic	
Course Learning	On succes	ssful completion	of this course, students should be all	ole to:	-		
Outcomes	CLO 2 ap ha CLO 3 int	pply different tec ands-on laborato erpret and discu	iss scientific data using appropriate s	carbohydrates scientific langua	, lipids, proteins and		
	CLO 4 co	llaborate effective	ely with team members in laboratory	/ sessions			
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021			L2220 or BMED2301 or MEDE2301		Examination	May	
						,	
Grade Descriptors (A+ to F)	Demonstrates thorough and extensive knowledge and skills required for attaining all the course learning outcomes. Shows strong analytical ability and logical thinking, with evidence of original thought. Competently conducts laboratory skills and techniques with confidence and can critically appraise data to draw appropriate and insightful conclusions. Demonstrates substantial knowledge and skills required for attaining most of the course learning outcomes. Shows evidence of critical thinking and analytical skills. Conducts laboratory skills and techniques with confidence and can appraise data to draw appropriate conclusions.						
	Demonstrates general but incomplete knowledge and skills required for attaining most of the course learning outcomes. Shows some evidence of critical thinking and analytical skills. Conducts laboratory skills and techniques to a satisfactory level of competence and can sometimes correctly appraise data and draw appropriate conclusions.						
	Demonstrates partial but limited knowledge and skills required for attaining some of the course learning outcomes. Shows limited critical thinking and analytical skills. Displays poor laboratory skills and techniques and is rarely able to use data to draw appropriate conclusions.						
	Fail		thinking. Displays ineffective lab skills an				
Course Type			mponent course				
Course Teaching	Activities	3	Details			No. of Hours	
& Learning Activities	Lectures						
	Laborator	У				72	
	Tutorials					6	
	Reading /	Self study				76	
Assessment Methods and Weighting	Methods		Details		ghting in final irse grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents			50	CLO 1,2,3,4	
	Examinat				50	CLO 1,2,3	
Required/recommended			O'Donnell M (2015) Molecular Biolog	v. Principles as			
reading and online materials	Scopes R		n Purification: Principles and Praction				

BIOC3605	Sequence	ce bioinformatics (6	credits)		Academic Year	2020		
Offering Department	Biomedica	l Sciences	,		Quota	80		
Course Co-ordinator	Dr B C W							
Teachers Involved	(Dr B C W Wong,Biomedical Sciences) (Dr J W K Ho,Biomedical Sciences) This course will examine existing bioinformatics tools for DNA and protein sequence analysis. The							
Course Objectives	underlying analyze, a	principles of these anal and compare protein an	bioinformatics tools for I lysis programs and serv od DNA sequences usir ools for the analysis of r	rices will be presented. ng bioinformatics tools	Students will lea available on the	rn how to retrieve internet. A basio		
Course Contents & Topics	This course will introduce and discuss the following topics: DNA and protein sequence database, protein family databases; information searching and retrieval; Sin sequence analysis; sequence alignment: pair-wise alignment, multiple sequence alignment, substitution matri							
			gorithm and parameters s of next generation seq		nd motifs, and pro	files; phylogenetic		
Course Learning			course, students should					
Outcomes	CLO 2 de	scribe the algorithms of arch, phylogenetic trees	ence data from biologica commonly used methors construction, and gene	ds for pairwise and mu prediction	ltiple alignments,	BLAST database		
			equence analysis in vario					
	CLO 4 interpret results from sequence alignments, BLAST database searches, and phylogenetic trees construction CLO 5 carry out basic analysis of next generation sequencing data							
.			r next generation sequer or BBMS2003 or BBMS2		DIAEDOOO4			
Pre-requisites (and Co-requisites and Impermissible combinations)	1 a33 III DI	OCZOGO OF BIOLZZZZO O	I BEING2000 OF BEING2	OUT OF WILDLESOT OF	DIVILED 2001			
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	2022 : Y		Examination	May		
Grade Descriptors (A+ to F)	A Demonstrates thorough and complete mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes; strong critical thinking; excellent ability to apply bioinformatics skills in a range of context.							
,	В	learning outcomes; evidence	ommand of a broad range of e of critical thinking; good abili incomplete command of kno	ity to apply bioinformatics sk	ills in a range of conte	ext.		
	С		ing; adequate ability to apply			the course learning		
	D	Demonstrates partial but lim	nited command of knowledge ed ability to apply bioinformation	and skills required for attain	ing some of the cours	se learning outcomes;		
	Fail	of critical thinking; little or no	idence of command of knowle ability to apply bioinformatics		attaining the course le	arning outcomes; lack		
Course Type	1	ased course	I=					
Course Teaching	Activities		Details	Details		No. of Hours		
& Learning Activities	Lectures					36		
	Tutorials	0 15 1 1				12		
		Self study				100		
Assessment Methods and Weighting	Methods		Details		ting in final e grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents			30	CLO 1,2,3,4,5		
	Examinat	ion			70	CLO 2,3,4		
Required/recommended reading and online materials	Mount, D.		5. Bioinformatics and mo cs:sequence and gen					

BIOC3606	Molec	ılar medicine (6 credits)		Academic Year	2020		
Offering Department	Biomedical Sciences Quota 50						
Course Co-ordinator	Prof D	Jin, Biomedical Sciences (dyjin@hku.	hk)				
Teachers Involved	(Dr. S I (Dr. YC (Prof D	ao,Biomedical Sciences) Y Ma,Biomedical Sciences) Song,Biomedical Sciences) Y Jin,Biomedical Sciences) S E Cheah,Biomedical Sciences)					
Course Objectives	and in	de up-to-date knowledge of the molec ection with HIV and influenza viruse ological, pharmaceutical and genomic	es, thereby preparing the stude research.	ents for a caree	r in biomedical,		
Course Contents & Topics	molecu and tur molecu gene ti	urse covers cell signaling in relation to ar therapeutics. Specific topics may in our suppressor genes, genome instat ar approaches to vaccine developme erapy, and nucleic acid therapeutics. d for students taking this course.	clude cell signaling, mouse mod bility, HIV science, genetics and nt, immune checkpoint therapy,	el of human disea pathogenesis of i stem cells and st	ases, oncogenes nfluenza viruses, em cell therapy,		
Course Learning	On suc	essful completion of this course, stude	nts should be able to:				
Outcomes	CLO 1 explain the molecular mechanisms underlying selected human diseases including cancer and emerging infections						
	CLO 2 illustrate the application of molecular biology in medicine with examples; apply biochemical, molecular and cell biological, genetic, immunological as well as microbiological principles and methods to solve new medical problems						
	CLO 3	CLO 3 interpret and communicate new results about molecular aspects of medicine in the literature to a wider audience in the community					
	CLO 4 integrate and translate knowledge in molecular biology to new approaches in disease prevention and intervention						
Pre-requisites (and Co-requisites	Pass in	BIOC2600 or BIOL2220 or MEDE2301	or BMED2301				

and Impermissible combinations)						
Offer in 2020 - 2021	Y 2nd	I sem Offer in 2021 - 2	2022 : Y	Examination	May	
Grade Descriptors (A+ to F)	A Displays a comprehensive grasp of the key concepts underlying the molecular basis of human diseases, with few omissions or errors. Able to articulate clearly with examples how knowledge in molecular biology can lead to new strategies in disease prevention and intervention. Evidence of strong analytical and critical thinking when dealing with complex scientific data. Some evidence for additional information beyond what is given in the lectures.					
	B Displays a substantial and near-complete grasp of the key concepts underlying the molecular basis of human diseases, but without depth in some areas and with some omissions and factual errors. An understanding of the topic though is clear. Able to relate knowledge in molecular biology to new strategies in disease prevention and intervention. Able to apply analytical and critical thinking skills when dealing with scientific data.					
	С	relate knowledge in molec		derlying the molecular basis of human disease es in disease prevention and intervention. S entific data.		
	D		ology to new strategies in dise	lerlying the molecular basis of human disease ase prevention and intervention. Evidence of w		
	Fail			e key concepts underlying the molecular basis ategies. No evidence of analytical or critical th		
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	3	Details	No. of Hours		
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examinat	ion		70	CLO 1,2,3,4	
	Test			30	CLO 1,2,3,4	
Required/recommended reading and online materials	Alberts et		f the Cell 6th ed., 2015 (is available at NCBI Books) 4th ed. is available at NCBI Books)		

	Directe	ed studies in bio	chemistry (6 credits)	Academic Yea	ar 2020			
Offering Department	Biomedic	Biomedical Sciences Quota 36						
Course Co-ordinator	Prof J D	Prof J D Huang, Biomedical Sciences (jdhuang@hku.hk) (All academic staff in Biochemistry Major,Biomedical Sciences)						
Teachers Involved	(All acad	(All academic staff in Biochemistry Major,Biomedical Sciences) (Prof J D Huang,Biomedical Sciences)						
	(Prof J D Huang,Biomedical Sciences) To enhance students knowledge of a particular topic and the students self-directed learning and critical thinkin							
Course Objectives	To enha skills.	To enhance students knowledge of a particular topic and the students self-directed learning and critical thinking skills.						
Course Contents & Topics	member critical re	The student undertakes a self-managed study on a topic in biochemistry under the supervision of a staff member. The topic is preferably one not sufficiently covered in the regular curriculum. The directed study can be a critical review or a synthesis of published work on the subject. A laboratory or field study may also be involved that would enhance the student's understanding of the subject.						
Course Learning			of this course, students should be able to:					
Outcomes			esearch literature in a specific area of bioc	hemistry and molecular big	ology			
		, , , ,	tical or experimental basis for existing con		37			
			nd evaluate issues for further research de	•				
			ata in original research articles and comm	•	scientific language			
Pre-requisites			of advanced level (level 3 or 4) disciplinar	0 11 1	0 0			
and Co-requisites			L2220 and BIOL3401	,	,			
and Impermissible		•	Biochemistry Major students only.					
combinations)			s allowed to take this capstone course is t	heir year 3 study.				
Offer in 2020 - 2021	Y 1s	st sem 2nd sem	Summer Offer in 2021 - 2022 : Y	Examination	No Exam			
Grade Descriptors (A+ to F)	A Produces a sophisticated and detailed appraisal of the biochemical literature, displaying a comprehensive and deep understanding of the selected topic. Able to contextualize all the ideas within a personal framework of knowledge and evaluate relevant issues emerging from the study. Works proactively with a supervisor to enhance understanding and scientific writing skills. Communicates the findings to a broader audience in an effective way and responds knowledgeably to questions. Excellen time-management skills and able to reflect honestly on one's own learning.							
	Produces a coherent appraisal of the biochemical literature, displaying a sound understanding of the selected topic. Able to contextualize many of the ideas within a personal framework of knowledge and identify some relevant issues emerging from the study. Works constructively with a supervisor to enhance understanding and scientific writing skills. Clearly communicates the findings to a broader audience and responds knowledgeably to most questions. Able to time-manage effectively and reflect o one's own learning.							
		findings to a broade one's own learning.	er audience and responds knowledgeably to most q	ng and scientific writing skills. Cl juestions. Able to time-manage of	early communicates the effectively and reflect of			
	С	findings to a broade one's own learning. Produces a reasona to contextualize a fe issues emerging fro skills. Communicate		ig and scientific writing skills. Cl juestions. Able to time-manage ε leg an adequate understanding of ledge and makes some attempt to workers to improve understand	learly communicates the effectively and reflect of the selected topic. Ab to identify some relevaing and scientific writing			
	C	findings to a broade one's own learning. Produces a reasona to contextualize a fe issues emerging fro skills. Communicate time-management a Produces a superfic contextualize a few from the study. Wor	er audience and responds knowledgeably to most quable appraisal of the biochemical literature, displaying which of the ideas within a personal framework of known the study. Works with a supervisor and other costs the findings to a broader audience with reasonal	ng and scientific writing skills. Cluestions. Able to time-manage of an adequate understanding of ledge and makes some attempt it-workers to improve understandible clarity and responds to most ag a limited understanding of the dege but unable to identify any refers to develop understanding and its statement of the statement of	learly communicates the effectively and reflect of the selected topic. Ab to identify some relevating and scientific writing that questions. Acceptable e selected topic. Able elevant issues emerging d scientific writing skill d scientific writing skill d			
		findings to a broade one's own learning. Produces a reasona to contextualize a fe issues emerging fro skills. Communicate time-management a Produces a superfic contextualize a few from the study. Woo Displays weak correflection skills. Fails to appraise the contextualize the ide in isolation, thus fail	er audience and responds knowledgeably to most quable appraisal of the biochemical literature, displaying which of the ideas within a personal framework of known the study. Works with a supervisor and other cost the findings to a broader audience with reasonal and self-reflection skills. cial appraisal of the biochemical literature, displaying the ideas within a personal framework of knowletks reluctantly with a supervisor and other co-workets.	ng and scientific writing skills. Cluestions. Able to time-manage of the science	learly communicates the affectively and reflect of the selected topic. Abto identify some relevating and scientific writing the acceptable selevant issues emerging discientific writing skill e-management and selected topic. Unable in grow the study. Wor			
Course Type	D Fail	findings to a broade one's own learning. Produces a reasona to contextualize a fe issues emerging fro skills. Communicate time-management a Produces a superfic contextualize a few from the study. Woo Displays weak correflection skills. Fails to appraise the contextualize the ide in isolation, thus fail	er audience and responds knowledgeably to most quable appraisal of the biochemical literature, displaying the of the ideas within a personal framework of knowns the study. Works with a supervisor and other coest the findings to a broader audience with reasonal staff-reflection skills. The biochemical literature, displaying of the ideas within a personal framework of knowledge in the biochemical literature and other co-works amunication skills when presenting the findings to me biochemical literature and thus unable to displayers within a personal framework of knowledge or idealing to make progress in understanding and scientif	ng and scientific writing skills. Cluestions. Able to time-manage of the science	learly communicates the affectively and reflect of the selected topic. Abto identify some relevating and scientific writing the acceptable selevant issues emerging discientific writing skill e-management and selected topic. Unable in grow the study. Wor			
Course Teaching	D Fail	findings to a broade one's own learning. Produces a reasona to contextualize a fe issues emerging fro skills. Communicate time-management a Produces a superfic contextualize a few from the study. Wo Displays weak contextualize the ide in isolation, thus fail presenting the findin pased course	er audience and responds knowledgeably to most quable appraisal of the biochemical literature, displaying the of the ideas within a personal framework of knowns the study. Works with a supervisor and other coest the findings to a broader audience with reasonal staff-reflection skills. The biochemical literature, displaying of the ideas within a personal framework of knowledge in the biochemical literature and other co-works amunication skills when presenting the findings to me biochemical literature and thus unable to displayers within a personal framework of knowledge or idealing to make progress in understanding and scientif	ng and scientific writing skills. Cluestions. Able to time-manage of the science	learly communicates the affectively and reflect of the selected topic. Abto identify some relevating and scientific writing the acceptable selevant issues emerging discientific writing skill e-management and selected topic. Unable in grow the study. Wor			
Course Type Course Teaching & Learning Activities	D Fail Project-t	findings to a broade one's own learning. Produces a reasona to contextualize a fe issues emerging fro skills. Communicate time-management a Produces a superfic contextualize a few from the study. Wo Displays weak contextualize the ide in isolation, thus fail presenting the findin pased course	er audience and responds knowledgeably to most quable appraisal of the biochemical literature, displaying the of the ideas within a personal framework of known the study. Works with a supervisor and other coses the findings to a broader audience with reasonal and self-reflection skills. The ideas within a personal framework of knowler fixer reluctantly with a supervisor and other co-worke and the self-reflection skills when presenting the findings to the biochemical literature and thus unable to displaying the seas within a personal framework of knowledge or ideas within a personal framework of knowledge or ideas within a personal framework of knowledge or ideas within a personal framework of knowledge or idealing to make progress in understanding and scientifings to a broader audience. No time-management skings to a broader audience.	ng and scientific writing skills. Cluestions. Able to time-manage of the science	learly communicates the fectively and reflect of the selected topic. Abto identify some relevating and scientific writing the questions. Acceptable is selected topic. Able elevant issues emerging discientific writing skill e-management and selected topic. Unableing from the study. Worunicate effectively who			
Course Teaching	D Fail Project-t	findings to a broade one's own learning. Produces a reasona to contextualize a fe issues emerging fro skills. Communicate time-management a Produces a superfic contextualize a few from the study. Wor Displays weak correflection skills. Fails to appraise the contextualize the ide in isolation, thus fail presenting the finding pased course	ar audience and responds knowledgeably to most quable appraisal of the biochemical literature, displaying the of the ideas within a personal framework of knowns the study. Works with a supervisor and other costs the findings to a broader audience with reasonal state of the ideas within a personal framework of knowles resulted and the state of the ideas within a personal framework of knowless reluctantly with a supervisor and other co-worked amunication skills when presenting the findings to the biochemical literature and thus unable to display as within a personal framework of knowledge or ideas within a supervisor and other co-worker in the supervisor and other co-worker in the supervisor and other co-worker in the supervisor and other co-worker in the supervisor and other co-worker in the supervisor and other co-worker in the supervisor and other co-worker in the supervisor and other co-worker in the supervisor and other co-worker in the supervisor and other co-worker in the supervisor and other co-worker in the supervisor and other co-worker in the supervisor and other co-worker in the supervisor and other co-worker in the su	ng and scientific writing skills. Cluestions. Able to time-manage of the science	learly communicates the ffectively and reflect of the selected topic. Abto identify some relevating and scientific writing the questions. Acceptable selevant issues emerging discientific writing skille-management and selected topic. Unableing from the study. Workunicate effectively when the study. Workunicate effectively when the study. Workunicate effectively when the study. Workunicate effectively when the study. Workunicate effectively when the study. Workunicate effectively when the study. Workunicate effectively when the study. Workunicate effectively when the study. Workunicate effectively when the study. Workunicate effectively when the study. Workunicate effectively when the study			
Course Teaching Learning Activities Assessment Methods	Project-b Activitie Reading	findings to a broade one's own learning. Produces a reasons to contextualize a fe issues emerging fro skills. Communicate time-management a Produces a superfic contextualize a few from the study. Won Displays weak com reflection skills. Fails to appraise the contextualize the ide in isolation, thus fail presenting the finding passed course 9 / Self study S	ar audience and responds knowledgeably to most quable appraisal of the biochemical literature, displaying the of the ideas within a personal framework of knowns the study. Works with a supervisor and other costs the findings to a broader audience with reasonal and self-reflection skills. cial appraisal of the biochemical literature, displaying the ideas within a personal framework of knowlengers reluctantly with a supervisor and other co-works reluctantly with a supervisor and other co-works amunication skills when presenting the findings to the biochemical literature and thus unable to display as within a personal framework of knowledge or ideling to make progress in understanding and scientifings to a broader audience. No time-management skills at least 120 hours on the project	g and scientific writing skills. Cl questions. Able to time-manage of g an adequate understanding of ledge and makes some attempt it- workers to improve understand ible clarity and responds to mos ng a limited understanding of the dege but unable to identify any re ers to develop understanding an- a broader audience. Poor time ay any understanding of the se entify any relevant issues emergir ic writing skills. Unable to comm lls or ability to self-reflect. Weighting in final	learly communicates the ffectively and reflect of the selected topic. Abto identify some relevating and scientific writing the questions. Acceptable elevant issues emerging discientific writing skille-management and selected topic. Unableing from the study. Worunicate effectively when the study. Worunicate effectively when the study. Worunicate effectively when the study. Worunicate effectively when the study. Worunicate effectively when the study. Worunicate effectively when the study. Worunicate effectively when the study. Worunicate effectively when the study. Worunicate effectively when the study. Worunicate effectively when the study. Worunicate effectively when the study.			

	Research report	Supervisor comments	15	CLO 1,2,3,4
Required/recommended reading and online materials	as suggested by project supervisor	ors		

BIOC4610	Advance	ed biochemistry (6 credits)	Academic Yea	r 2020		
Offering Department	Biomedica	al Sciences		Quota	50		
Course Co-ordinator	Dr K M Ya	ao, Biomedical Scienc	es (kmyao@hku.hk)				
Teachers Involved	(Dr K M Y	C Ti,Biomedical Sciences, Biomedical Sciences, Biom	ces)				
	(Prof D Chan,Biomedical Sciences) (Prof J D Huang,Biomedical Sciences) This course aims at providing students an in-depth understanding of molecular and cellular signaling in multicellul						
Course Objectives	organisms. This course is particularly useful for students interested in research or intending to develop a career in biomedical sciences.						
Course Contents & Topics	Cell-surface	ce receptors and sign pathways that contro	l gene expression: receptor	-Protein-coupled receptors: structur s that activate protein tyrosine kina eceptor serine kinases that activate	ses, the Ras/MAF		
	The micro			e actin cytoskeleton; myosin; the int ar transport in neuron	ermediate filament		
	Transloca		teins - insertion into the ER	; major protein sorting pathways; p of vesicular traffic; protein sorting an			
	Cell-cell a		matrix (ECM) junctions and	d their adhesion molecules; cadhe			
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 describe and explain the molecular and cellular signal transduction mechanisms that mediate cellular communication to achieve a plethora of cellular responses in multicellular organisms						
	CLO 2 apply knowledge in molecular cell biology to analyze new findings and to design further experiments CLO 3 interpret data in research articles/problem-solving questions and communicate using appropriate scientific language						
		•	ssmates in tutorial classes				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Bl	IOC3601 or BIOL340 ⁻	1 or BIOL3402 or BIOL3404				
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 -	. 2022 · Y	Examination	Dec		
Grade Descriptors (A+ to F)	Y 1st sem Offer in 2021 - 2022 : Y Examination Dec A Demonstrate thorough and complete mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong critical thinking and analytical skills, with evidence of original thought, and ability to apply						
(A. 101)	В	knowledge to a wide range Demonstrate substantial	ge of complex, familiar and unfamilia command of a broad range of kno	ar situations. owledge and skills required for attaining at le	ast most of the course		
		learning outcomes. Show evidence of critical thinking and analytical skills, and ability to apply knowledge to familiar and some unfamiliar situations.					
	С						
	 outcomes. Show evidence of some critical thinking and analytical skills, and ability to apply knowledge to most familiar situations. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some critical thinking, but with limited analytical skills. Show limited ability to apply knowledge to solve problems. 						
	Fail			and skills required for attaining the course leadility to apply knowledge to solve problems.	earning outcomes. Lack		
Course Type	Lecture-ba	ased course	-				
Course Teaching	Activities	3	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading /	Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents		30	CLO 1,2,3,4		
	Examinat			70	CLO 1,2,3		
Required/recommended reading and conline materials	Lodish H	et al (2016) Molecular	Cell Biology, 8th ed. Freemar Biology of the Cell, 6th ed.	an (New York) & Macmillan (England Garland Science, New York.			

BIOC4611	Advanced biochemistry II (6 credits)	Academic Year	2020
Offering Department	Biomedical Sciences	Quota	50
Course Co-ordinator	Prof D Chan, Biomedical Sciences (chand@hku.hk)		
Teachers Involved	(Dr C M Qian,Biomedical Sciences) (Dr J Tanner,Biomedical Sciences) (Dr M Kotaka,Physiology) (Dr N S Wong,Biomedical Sciences) (Prof D Chan,Biomedical Sciences)		
Course Objectives	This course is aim at providing students with an up-to-date knowledge of protestructure and disease; realizing the importance of kinetics in cellular functiechnological advances in the characterization of macromolecules.		

Course Contents & Topics	changes characte	in protein function; ca rization of macromole	and misfolding in disease talytic mechanisms of e cules using X-ray crys engineering and therapeu	nzymes and enzyme l stallography, nuclear	kinetics; biomole magnetic resor	ecular interactions; nance and other			
Course Learning	On succe	essful completion of this	course, students should	be able to:	_				
Outcomes	CLO 1 c	lescribe how protein str	uctures inform functions						
	CLO 2 recognize the roles of enzyme kinetics in cellular functions								
	CLO 3 c	lerive structural informa	tion of macromolecules fi	rom experimental data					
	CLO 4 apply their knowledge on protein engineering and therapeutics, and on experimental design applied research								
Pre-requisites	Pass in E	Pass in BIOC3601; and BIOL3404 or CHEM2441; and							
(and Co-requisites and Impermissible combinations)	Pass in E	BIOC4610, or already e	nrolled in this course						
Offer in 2020 - 2021	N O	ffer in 2021 - 2022 : N			Examination				
Grade Descriptors (A+ to F)	A	enzyme function and in	ription of how protein structure terpretation of data; effectual ive, systematic and creative org	I demonstration of applying	g knowledge to the	e design of scientific			
	B Clear description of how protein structure informs function; evidence of ability to recognize mechanisms of enzyme function and interpretation of data; capable demonstration of applying knowledge to the design of scientific methodologies; and cohesive and systematic organization of information for presentation and communication.								
	С								
	D	Superficial awareness of how protein structure informs function; limited evidence of ability to recognize mechanisms of enzyme function and interpretation of data; superficial demonstration of applying knowledge to the design of scientific methodologies and limited organizational skill of information for presentation and communication.							
	Fail Lack of awareness of how protein structure informs function; lack of ability to recognize mechanisms of enzyme function an interpretation of data; superficial demonstration of applying knowledge to the design of scientific methodologies; insufficien organizational skill of information for presentation and communication.								
Course Type	Lecture-l	pased course							
Course Teaching	Activitie	es	Details			No. of Hours			
& Learning Activities	Lectures	5				36			
	Tutorials	3				12			
	Reading	/ Self study				100			
Assessment Methods and Weighting	Method	s	Details		ting in final e grade (%)	Assessment Methods to CLO Mapping			
	Assignm	nents			30	CLO 1,2,3,4			
	Examina	ation			70	CLO 1,2,3,4			
Required/recommended reading and online materials		eman, New York.	Mechanism in Protein Sc	ience: A Guide to Enz	me Catalysis ar	nd Protein Folding.			

	Molecu	lar biology of th	e gene (6 credits)	Academic Yea	r 2020			
Offering Department	Biomedic	al Sciences		Quota	50			
Course Co-ordinator	Prof K S E Cheah, Biomedical Sciences (hrmbdkc@hku.hk) (Dr K M Yao,Biomedical Sciences)							
Teachers Involved	(Prof K S (Prof. PT	/ao,Biomedical Scie E Cheah,Biomedic Liu,Biomedical Scie Zhou,Biomedical Sc	al Sciences) ences)					
Course Objectives		To provide an up-to-date knowledge of molecular biology, especially with respect to the regulation of eukaryotic gene expression.						
Course Contents & Topics	function.		course covering many detailed te an understanding of how gene of gained.					
Course Learning	On succe	ssful completion of	this course, students should be all	ble to:				
Outcomes	CLO 1 d	escribe the mechan	nisms for regulation of transcription	n, RNA processing and translation	in eukaryotes			
		xplain how cellular nultiple levels	homeostasis can be maintained	by a combination of controls of g	ene expression at			
	CLO 3 illustrate the hierarchy of gene expression regulation in stem cells and developmental processes							
	CLO 4 interpret experimental results in gene regulation studies							
			classmates in tutorial classes					
(and Co-requisites and Impermissible			classmates in tutorial classes 401 or BIOL3402 or BIOL3404 or	BBMS2007				
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	Pass in B	BIOC3601 or BIOL3		BBMS2007 Examination	May			
(and Co-requisites and Impermissible combinations)	Pass in B	d sem Offer in 20: Demonstrates a deep disease and effective experimental data fro	401 or BIOL3402 or BIOL3404 or 21 - 2022 : Y p and comprehensive understanding of the ly relates the knowledge to developmen m gene regulation studies.	Examination The regulation of eukaryotic gene expressional processes. Uses skill and insight to	on and its relevance to analyse and interpret			
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in B	d sem Offer in 20: Demonstrates a deer disease and effective experimental data fro Demonstrates a com disease and is able to gene regulation studie	401 or BIOL3402 or BIOL3404 or 21 - 2022: Y p and comprehensive understanding of th ely relates the knowledge to developmer m gene regulation studies. petent grasp of the key concepts in the o link the knowledge to developmental pro es.	Examination ne regulation of eukaryotic gene expressintal processes. Uses skill and insight to regulation of eukaryotic gene expression cesses. Correctly analyses and interprets	on and its relevance to analyse and interpret n and its relevance to experimental data from			
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 2nd	d sem Offer in 20: Demonstrates a deer disease and effective experimental data fro Demonstrates a com disease and is able to gene regulation studion Demonstrates a bas sometimes able to rexperimental data fro	401 or BIOL3402 or BIOL3404 or 21 - 2022 : Y p and comprehensive understanding of the lety relates the knowledge to development of the general grasp of the key concepts in the link the knowledge to developmental proces. ic understanding of the regulation of eurelate the knowledge to developmental promagene regulation studies.	Examination ne regulation of eukaryotic gene expressintal processes. Uses skill and insight to regulation of eukaryotic gene expressic cesses. Correctly analyses and interprets karyotic gene expression and its relevarocesses. Displays a limited capacity to	on and its relevance to analyse and interpret in and its relevance to experimental data from nice to disease and is analyse and interpret			
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 2nd A	d sem Offer in 20: Demonstrates a deep disease and effective experimental data fro Demonstrates a correlation disease and is able to gene regulation studion Demonstrates a bas sometimes able to rexperimental data fro Demonstrates a simplemental data fro	401 or BIOL3402 or BIOL3404 or 21 - 2022 : Y p and comprehensive understanding of the ley relates the knowledge to development or grape of the key concepts in the lo link the knowledge to developmental proes. ic understanding of the regulation of eu elate the knowledge to developmental profess.	Examination The regulation of eukaryotic gene expression and processes. Uses skill and insight to regulation of eukaryotic gene expression cesses. Correctly analyses and interprets karyotic gene expression and its relevarocesses. Displays a limited capacity to karyotic gene expression and rarely relikaryotic gene expression and rarely relikaryotic gene expression and rarely reliable.	on and its relevance to analyse and interpret in and its relevance to experimental data from noce to disease and is analyse and interpret tes the information to			
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Pass in B Y 2n A B C D	d sem Offer in 20: Demonstrates a deep disease and effective experimental data fro Demonstrates a comdisease and is able to gene regulation studion Demonstrates a bassometimes able to rexperimental data fro Demonstrates a simple developmental procestudies. Demonstrates incomdevelopmental procestudies.	401 or BIOL3402 or BIOL3404 or 21 - 2022 : Y p and comprehensive understanding of the lety relates the knowledge to development of the general grasp of the key concepts in the oten that the knowledge to developmental proces. ic understanding of the regulation of euelate the knowledge to developmental promagener egulation studies. plistic knowledge of the regulation of euelate the knowledge of the regulation of eue	Examination The regulation of eukaryotic gene expression and insight to regulation of eukaryotic gene expression and insight to regulation of eukaryotic gene expression and its relevancesses. Correctly analyses and interprets karyotic gene expression and its relevancesses. Displays a limited capacity to karyotic gene expression and rarely relision are religiously as a limited capacity to the results of the religious and rarely religious are religiously as a limited capacity to the religious and rarely religious are religiously as a limited capacity to the religious and rarely religiously as a limited capacity to the religious and rarely religiously as a limited capacity to the religious and rarely religiously as a limited capacity to the religious and rarely religiously as a limited capacity to the religious and rarely religiously as a limited capacity to the religious and rarely religiously as a limited capacity to the religious and rarely religious and rarel	on and its relevance to analyse and interpret in and its relevance to experimental data from once to disease and is analyse and interpret tes the information to a from gene regulation			
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in B Y 2n A B C D	d sem Offer in 20: Demonstrates a deep disease and effective experimental data fro Demonstrates a comdisease and is able to gene regulation studion Demonstrates a bassometimes able to rexperimental data fro Demonstrates a simple developmental procestudies. Demonstrates incomdevelopmental procestased course	401 or BIOL3402 or BIOL3404 or 21 - 2022: Y p and comprehensive understanding of the lety relates the knowledge to development of the link the knowledge to development of link the knowledge to developmental proces. ic understanding of the regulation of eurelate the knowledge to developmental prom gene regulation studies. plistic knowledge to the regulation of eurelate the knowledge to the regulation of eusess. Displays weak analytical skills and in the plete or incorrect knowledge of the regulation studies.	Examination The regulation of eukaryotic gene expression and insight to regulation of eukaryotic gene expression and insight to regulation of eukaryotic gene expression and its relevancesses. Correctly analyses and interprets karyotic gene expression and its relevancesses. Displays a limited capacity to karyotic gene expression and rarely relision are religiously as a limited capacity to the results of the religious and rarely religious are religiously as a limited capacity to the religious and rarely religious are religiously as a limited capacity to the religious and rarely religiously as a limited capacity to the religious and rarely religiously as a limited capacity to the religious and rarely religiously as a limited capacity to the religious and rarely religiously as a limited capacity to the religious and rarely religiously as a limited capacity to the religious and rarely religiously as a limited capacity to the religious and rarely religious and rarel	on and its relevance to analyse and interpret in and its relevance to experimental data from once to disease and is analyse and interpret tes the information to a from gene regulation			

	Lectures			36
	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		20	CLO 1,2,3,4,5
	Examination		80	CLO 1,2,3,4
Required/recommended reading and online materials	Alberts B et al. (2014) Molecular E Watson JD et al. (2014) Molecular			San Francisco.

BIOC4613	Advand	•	n biochemistry & molecular biolog	y (6 Academic Yea	2020				
Offering Department	Biomedic	cal Sciences		Quota	70				
Course Co-ordinator	Prof D Chan, Biomedical Sciences (chand@hku.hk) (Dr B C W Wong,Biomedical Sciences)								
Teachers Involved	(Dr B C	W Wong,Biomedical	Sciences)						
	`	Tanner,Biomedical So	,						
	`	H Wong,Biomedical	,						
		(Dr. M C H Cheung,Biomedical Sciences) Prof D Chan,Biomedical Sciences)							
Course Objectives		(Prof D Chan,Biomedical Sciences) This is an advanced experimental-based course for students majoring in Biochemistry and related disciplines. T							
Course Objectives		aim is to provide the necessary training for students to pursuit postgraduate research education and poter							
	employment in a scientific laboratory/industry environment.								
Course Contents	employment in a scientific laboratory/industry environment. Hands-on experiments using advanced techniques in biochemistry, molecular and cell biology, and								
& Topics	bioinformatics. Students will also have the opportunity to familiarize themselves with modern instruments used in								
	life scien	bioinformatics. Students will also have the opportunity to familiarize themselves with modern instruments used if life sciences.							
Course Learning		•	this course, students should be able to:						
Outcomes			ciples of current advanced techniques co	mmonly used in biochem	istry and molecula				
		biology	ese techniques in other novel experimenta	al cottings					
			erimental data and design alternative app	•	e hypotheses				
			members to complete laboratory experim		e Hypotheses				
			work and data using a laboratory notebo		actices in researc				
		laboratories	and data doing a taboratory notice	on ronoming oranical a pr					
Pre-requisites	Pass in I	BIOC3604							
and Co-requisites									
and Impermissible									
combinations)									
Offer in 2020 - 2021	-	st sem Offer in 202		Examination	Dec				
Grade Descriptors (A+ to F)	A Comprehensive and in-depth understanding of the principles and applications of advance technologies in biochemistry; clear and effective ability to identify problems and generate solutions relating to applications in a laboratory setting; clear evidence of ability to evaluate experimental data; cohesive and systematic planning and organization of experimental design and presentation of experimental data.								
	B Comprehensive understanding of the principles and applications of advance technologies in biochemistry; clear ability to identify problems and generate solutions relating to applications in a laboratory setting; evidence of ability to evaluate experimental data systematic planning and organization of experimental design and presentation of experimental data.								
	C Sound understanding of the principles and applications of advance technologies in biochemistry; sound ability to identify								
	problems and generate solutions relating to applications in a laboratory setting, some evidence of ability to evaluate experimenta								
	data; satisfactory planning and organization of experimental design and presentation of experimental data. D Superficial understanding of the principles and applications of advance technologies in biochemistry; limited ability to identify								
	problems and generate solutions relating to applications in a laboratory setting; some awareness of ability to evaluate								
	experimental data; some evidence of planning and organization of experimental design and presentation of experimental data.								
	Fail Lack of understanding of the principles and applications of advance technologies in biochemistry; lack of ability to identify problems and generate solutions relating to applications in a laboratory setting; lack of evidence of ability to evaluate experimental data; insufficient evidence of planning and organization of experimental design and presentation of experimental data.								
Course Type	Lecture	with laboratory comp	onent course						
Course Teaching	Activitie	es	Details		No. of Hours				
& Learning Activities	Lectures	s			12				
	Laborate	,			72				
	Tutorials				6				
		g / Self study			76				
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping				
	Assignm	nents		50	CLO 1,2,3,4,5				
	Examina		One 3-hour written examination	50	CLO 1,2,3,4				
Required/recommended reading and		K, Walker KM (2010) ty Press, Cambridge.	Principles and Techniques of Biochemist	ry and Molecular Biology	7th ed. Cambridg				
online materials									

BIOC4966	Biochemistry internship (6 credits)	Academic Year	2020
Offering Department	Biomedical Sciences	Quota	20
Course Co-ordinator	Prof J D Huang, Biomedical Sciences (jdhuang@hku.hk)		
Teachers Involved	(All academic staff in Biochemistry Major,Biomedical Sciences) (Prof J D Huang,Biomedical Sciences)		
Course Objectives	This course aims to offer students the opportunities to gain work experience in t study. The workplace learning experience would be of great benefit to the s gained in the study to the real work environments. Students have to take on at either within the University or outside the University arranged by the School/Dep	tudents to apply least 160 hours o	their knowledge

Course Contents & Topics		e university: The studes as instructed by the	ent will be supervised by a staff Supervisor.	member (Supervisor), work	king on a project or	
	be supervise	ed under a staff mem	lent will work in an external agend ber of the external agency (the E (the Internal Supervisor).			
Course Learning			ourse, students should be able to	:		
Outcomes	CLO 1 re	cognize the strengths	and limitations of their area of train	ning or expertise		
	CLO 2 ac	quire problem-solving	skills to solve novel and ill-define	d problems		
	CLO 3 wo	ork effectively with coll	eagues in laboratories or other re	al world environments		
	CLO 4 ex	amine the role of scie	nce in our society			
Pre-requisites (and Co-requisites and Impermissible	including BIG	DC3604.	nced level (level 3 or 4) disciplinates emistry Major students only.	ary core/elective courses in	Biochemistry Major	
combinations)	The earliest	that a student is allow	ed to take this capstone course is	their year 3 study.		
Offer in 2020 - 2021	Y 1st se	m 2nd sem Summ	ner Offer in 2021 - 2022 : Y	Examination	No Exam	
Grade Descriptors (Pass /Pass with distinction /Fail)	Distincti on					
	Pass	Able to apply knowledge to solve problems in the workplace. Successfully handles and carries out the work required in the job or assigned by supervisor(s). Establishes effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc. Students demonstrating excellent performance in the above would be awarded a grade of "Distinction".				
	Fail	Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required in the job of assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other colleagues, of clients in the job. Fails to satisfy the requirements set out in the Course Description regarding working hours, written and ora report, or evaluation by supervisor(s), etc.				
Course Type	Internship					
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Internship w	rork	it is expected that students are to work at least 160 hours (or the equivalent of 4 weeks full-time)		160	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Oral present	tation		30	CLO 1,2,4	
	Supervisor's			30	CLO 1,2,3,4	
	Written repo			40	CLO 1,2,3,4	
Additional Course Information	be recorded interested to Enrolment or	on the student's trai enrol in this course sl f this course is not co	rise can be counted towards the onscript. This course will be assented to contact the Department to conducted via the online course selegater approval has been obtained	essed on "Pass/Fail" basis. btain the approval. ection system and should b	Students who are e made through the	

BIOC4999	Biochemistry project (12 credits)	Academic Yea	ar 2020			
Offering Department	Biomedical Sciences	Quota	25			
Course Co-ordinator	Dr N S Wong, Biomedical Sciences (nswong@hku					
Teachers Involved	(All academic staff in Biochemistry Major,Biomedica (Dr N S Wong,Biomedical Sciences)					
Course Objectives	To enable students to acquire the basic skills in scientific research emphasizing on critical and analytical reasoning, free and creative thinking, scholarly communication (both orally and in writing), research integrity, teamwork and time management. The course is particularly useful for those students who intend to pursue a career in life science either in research or industry.					
Course Contents & Topics	Project-related topics in biochemistry, cell, molecula Experimental methods in protein and nucleic acid bi Critical appraisal of current science literature Formulation of research questions Design of experiments. Data analysis and interpretation. Scientific writing					
Course Learning Outcomes	On successful completion of this course, students s CLO 1 describe recent research development in a CLO 2 formulate research questions and design e CLO 3 apply appropriate experimental techniques CLO 4 manage and interpret experimental results CLO 5 develop scientific writing skills and logically	defined area of biochemistry and molecular xperiments to address these questions to solve research problems	biology			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in at least 24 credits of advanced level (level including 4 of the following 5 courses: BIOL3401, BIOC4610 and BIOC4613 can be taken concurrent. This capstone course is for Biochemistry Major study. This capstone course is ONLY opened to students of the course is ONLY opened.	3 or 4) disciplinary core/elective courses in OC3601, BIOC3604, BIOC4610 and BIOC4 with this course. lents only.	613.			
Offer in 2020 - 2021	Y Year long Offer in 2021 - 2022 : Y	Examination	No Exam			
Grade Descriptors (A+ to F)	knowledge. Displays tenacity and commitment, comprehensively evaluated in the context of the workers to enhance practical and scientific writing scholarly way and responds knowledgeably to que		lysed with insight and supervisor and other co ence in an effective and			
	commitment, generating a sufficient body of data with skill and understanding. Works constructive	stigation, framing the research question within existing that is analysed and evaluated in the context of the or y with a supervisor and other co-workers to enhance or a broader audience and responds knowledgeably to	iginal research question practical and scientific			

	С	Plans and executes an experimental investigation, attempting to contextualize the research question. Works wit commitment in order to generate sufficient data for a reasonable analysis and evaluation in the context of the origin question. Works with a supervisor and other co-workers to improve practical and scientific writing skills. Commu findings to a broader audience with reasonable clarity and responds to most questions. Acceptable time-managemen Plans and executes a rudimentary experimental investigation, showing a limited ability to contextualize the researce.				
	D	Displays minimal commitme reluctantly with a supervisor	ent when collecting data and is or	nly able to undertake a superficial analy practical and scientific writing skills. Disp	sis and evaluation. Works	
	Fail	context. Shows no commitr	nent when collecting data and pro ical and scientific writing skills. Dis	ved, ineffective or overly simplistic, that in oduces an incoherent analysis and evalures eplays weak communication skills when p	uation. Works in isolation,	
Course Type	Project-ba	sed course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Reading /	Self study			240	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Dissertati	on		60	CLO 1,2,3,4,5	
	Oral pres	entation	including continuous assessment (15%)	40	CLO 1,2,3,4,5	
Required/recommended reading and online materials	None pres	scribed				

BIOL3404	Protein s	structure and funct	ion (6 credits)	Academic Yea	r 2020	
Offering Department	Biomedica	al Sciences		Quota	70	
Course Co-ordinator	Dr C M Qi	an, Biomedical Science	s (cmqian@hku.hk)			
Teachers Involved	,	(ian,Biomedical Science (nai,Biological Sciences)	,			
Course Objectives	To provide students with a good understanding of protein structure, how structure subserves function, and the methods for study of both. This course provides a strong foundation for advanced courses in biochemistry are biotechnology.					
Course Contents & Topics	quaternary The relation specificity, Methods f microscop How prote function; Protein pu separation purity, opti	Elements of macromolecular structure: sequencing, prediction and determination of secondary, tertiary an quaternary structures; The relationship of protein structure and function: molecular motifs, binding and recognition, enzyme catalysis ar specificity; Methods for protein structure determination: X-ray crystallography, nuclear magnetic resonance and cryo electromicroscopy; How protein works: protein flexibility and dynamics, protein interaction, protein complex, and control of prote function; Protein purification and characterization: various liquid chromatographical methods and their uses in combination separation techniques, methods of determination of molecular mass, activity and purity, optical methods in protein determination, ultracentrifugation, protein polishing, stability and storage, method and devices for protein delivery.				
Course Learning	On succes	ssful completion of this	course, students should be able	e to:		
Outcomes		•	ing of principles of protein struc			
			• • • •	petween protein structure and fur	nction	
				•		
	CLO 3 have a basic understanding of major methods for macromolecular structure determination CLO 4 understand the principles regulating protein function in vivo					
			purify protein and the many ind			
Pre-requisites (and Co-requisites and Impermissible combinations)			or MEDE2301 or BMED2301			
Offer in 2020 - 2021		l sem Offer in 2021 - 2		Examination	May	
Grade Descriptors (A+ to F)	В	scientific literature. 3. Super 1. Good performance demo	rior writing and group communication sonstrating full understanding of the sul	e understanding of the subject matter. 2. skills. bject matter. 2. Coherent insight into the		
(4. 35.1)	Good writing and group collaboration skills. 1. Satisfactory performance demonstrating adequate understanding of the subject matter. 2. Some insight into the scientific literature. 3. Adequate writing and group collaboration skills.					
	D 1. Limited performance demonstrating some understanding of basic subject matter. 2. Some ability to use the scientific literature. 3. Limited writing and group collaboration skills.					
				e ()		
	Fail	1. Poor understanding of su		use of the scientific literature. 3. Unable	to write or collaborate.	
	Fail Lecture-ba	Poor understanding of suased course	ubject matter. 2. Little to no insight into	use of the scientific literature. 3. Unable		
Course Teaching	Fail Lecture-ba	Poor understanding of suased course		use of the scientific literature. 3. Unable	No. of Hours	
Course Teaching	Fail Lecture-ba Activities Lectures	Poor understanding of suased course	ubject matter. 2. Little to no insight into	use of the scientific literature. 3. Unable	No. of Hours 36	
Course Teaching	Fail Lecture-ba Activities Lectures Tutorials	1. Poor understanding of suased course	ubject matter. 2. Little to no insight into	use of the scientific literature. 3. Unable	No. of Hours 36 12	
Course Teaching & Learning Activities	Fail Lecture-ba Activities Lectures Tutorials Reading /	Poor understanding of subsets course S Self study	bject matter. 2. Little to no insight into		No. of Hours 36 12 100	
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods	1. Poor understanding of su ased course s	ubject matter. 2. Little to no insight into	Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping	
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods	1. Poor understanding of su ased course s / Self study	bject matter. 2. Little to no insight into	Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5	
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods	1. Poor understanding of su ased course s / Self study	bject matter. 2. Little to no insight into	Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping	
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati	1. Poor understanding of su assed course s / Self study	bject matter. 2. Little to no insight into	Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5	

BIOL1110		olecules to cells (6 creaits)		ear 2020	
Offering Department		Sciences		Quota	420	
Course Co-ordinator			B K C Chow (2nd sem), Biologic	cal Sciences <i>(gywchan@hku.hl</i>	k; bkcc @hku.hk)	
Teachers Involved		CLo,Biological Science				
		V Chan,Biological Scie Y Yuen,Biological Scie				
	,	C Chow, Biological Sci	,			
Course Objectives			sic conceptual understanding of	the biology of molecules and o	ells to undernin late	
	studies i	studies in applied biology, genetics, biochemistry, nutrition, biotechnology, microbiology, plant and animal physiology and developmental biology.				
Course Contents	. , .	•	e adopted to enable students to	integrate basic concepts in mol	lecules and cells an	
& Topics			hrough the exploration of conter			
			t of some of the questions to be			
			children resemble their parent			
			e? What determines gender and t happen if some genes are non		en resemble, but no	
			e diets related to good health? I		ietary requirements	
		t we live without plants				
			are the common features in a			
			d organs? What is a cell cycle a		happens if cell-cycl	
			w newly formed cells commit the		horopy the future o	
			ern biology: To what extent can fied food safe for consumption?			
	been imp		ilea loca sale loi consumption:	What are the denome rioject	s and why have the	
Course Learning			s course, students should be ab	le to:		
Outcomes	CLO 1 u	nderstand the relation	ships between genes in a gen	ome and the inherited phenoty	pes expressed in a	
		ving organism				
		, , , ,	nciple on how mutation of a gene			
			nce of dietary intake of biomolec	ii		
		escribe various stage evelopment	s in a cell division and that o	isturbance of this process the	ay result in cancer	
			l in genetic engineering			
			s of genetic engineering in gene	therapy and production of gene	tically modified food	
•			his course are expected to h	ave taken HKDSE Biology a	nd/or Chemistry or	
Pre-requisites (and Co-requisites and Impermissible combinations)	equivalent before.	it. For students witho		ave taken HKDSE Biology a e encouraged to take CHEM1 dical Sciences (BBMS) or Biod	nd/or Chemistry or 041 concurrently or chemistry (BIOC) or	
(and Co-requisites and Impermissible	equivalent before. Not for s Bachelor course sh	nt. For students witho tudents having taken of Medicine and Bach nould take the replace	his course are expected to hout HKDSE Chemistry, they are any level 2 (or above) Biomee	ave taken HKDSE Biology as encouraged to take CHEM1 dical Sciences (BBMS) or Biod. Students having taken level 2	nd/or Chemistry or 041 concurrently or chemistry (BIOC) or BBMS/BIOC/MBBS	
and Co-requisites and Impermissible combinations)	equivalen before. Not for s Bachelor course sh Sciences	nt. For students witho tudents having taken of Medicine and Bach nould take the replace	his course are expected to hour HKDSE Chemistry, they are any level 2 (or above) Biomedialor of Surgery (MBBS) coursement course for BIOL1110 in any and the surgery (MBBS).	ave taken HKDSE Biology as encouraged to take CHEM1 dical Sciences (BBMS) or Biod. Students having taken level 2 by regular major offered by the	nd/or Chemistry or 041 concurrently or chemistry (BIOC) or BBMS/BIOC/MBBS School of Biologica	
(and Co-requisites and Impermissible combinations)	equivalen before. Not for s Bachelor course sh Sciences Y 1st	tudents having taken of Medicine and Bach nould take the replacer .	his course are expected to hour HKDSE Chemistry, they are any level 2 (or above) Biomerelelor of Surgery (MBBS) coursement course for BIOL1110 in an er in 2021 - 2022: Y	ave taken HKDSE Biology as encouraged to take CHEM1 dical Sciences (BBMS) or Biodical Students having taken level 2 ny regular major offered by the Examination	nd/or Chemistry or 041 concurrently or chemistry (BIOC) or BBMS/BIOC/MBBS School of Biological Dec May	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	equivalen before. Not for s Bachelor course sh Sciences	tudents having taken of Medicine and Bach nould take the replace: sem 2nd sem Offe Demonstrate thorough noutcomes. Show strong a knowledge to a wide ran	his course are expected to hour HKDSE Chemistry, they are any level 2 (or above) Biomerelelor of Surgery (MBBS) coursement course for BIOL1110 in all are in 2021 - 2022: Your mastery at an advanced level of externallytical and critical abilities and logicage of complex, familiar and unfamiliar	ave taken HKDSE Biology as encouraged to take CHEM1 dical Sciences (BBMS) or Biod. Students having taken level 2 by regular major offered by the Examination sive knowledge required for attaining at thinking, with evidence of original the situations. Apply highly effective organical terms of the control of the contro	nd/or Chemistry or 041 concurrently or 041 concurrently or chemistry (BIOC) or BBMS/BIOC/MBB School of Biologica Dec May all the course learning bught, and ability to apply nizational skills. Writings	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	equivalen before. Not for s Bachelor course sh Sciences Y 1st	tudents having taken of Medicine and Bach nould take the replacer sem 2nd sem Offe Demonstrate thorough noutcomes. Show strong a knowledge to a wide ranconsistently demonstrate Demonstrate substantial	his course are expected to hour HKDSE Chemistry, they are any level 2 (or above) Biomedialor of Surgery (MBBS) coursement course for BIOL1110 in all and a state of the state	ave taken HKDSE Biology as encouraged to take CHEM1 dical Sciences (BBMS) or Biot. Students having taken level 2 hy regular major offered by the Examination sive knowledge required for attaining all thinking, with evidence of original the situations. Apply highly effective orgament with broad range of relevant concursed ge required for attaining at least most degree r	nd/or Chemistry or 041 concurrently or 041 con	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	equivalence before. Not for second s	tudents having taken of Medicine and Bach nould take the replace! Sem 2nd sem Offe Demonstrate thorough no utcomes. Show strong a knowledge to a wide rar consistently demonstrate Demonstrate substantial outcomes. Show evidence	his course are expected to hour HKDSE Chemistry, they are any level 2 (or above) Biomedial and the second of Surgery (MBBS) course ment course for BIOL1110 in all and the second of the	ave taken HKDSE Biology as encouraged to take CHEM1 dical Sciences (BBMS) or Biod. Students having taken level 2 by regular major offered by the Examination asive knowledge required for attaining at thinking, with evidence of original the situations. Apply highly effective orgament with broad range of relevant condage required for attaining at least more logical thinking, and ability to apply k	nd/or Chemistry or 041 concurrently or 041 concurrently or chemistry (BIOC) or BBMS/BIOC/MBS School of Biologica Dec May all the course learning bught, and ability to apply nizational skills. Writings bepts. st of the course learning nowledge to familiar and nowledge to familiar and 1041 concurrence.	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	equivalenbefore. Not for s Bachelor course st Sciences Y 1st A B	tudents having taken of Medicine and Bach nould take the replacer sem 2nd sem Offe Demonstrate thorough noutcomes. Show strong a knowledge to a wide rar consistently demonstrate Demonstrate substantial outcomes. Show evidenc some unfamiliar situatior engagement with broad rangement	his course are expected to hour HKDSE Chemistry, they are any level 2 (or above) Biomeduelor of Surgery (MBBS) coursement course for BIOL1110 in an er in 2021 - 2022: Y mastery at an advanced level of externallytical and critical abilities and logically and the complex familiar and unfamiliar informed, thoughtful intellectual engage command of a broad range of knowledge of analytical and critical abilities and ms. Apply effective organizational skills ange of relevant concepts.	ave taken HKDSE Biology as electric encouraged to take CHEM1 dical Sciences (BBMS) or Biod. Students having taken level 2 hy regular major offered by the Examination asive knowledge required for attaining at thinking, with evidence of original the situations. Apply highly effective organization that the properties of the propertie	nd/or Chemistry or 041 concurrently or 041 con	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	equivalence before. Not for second s	tudents having taken of Medicine and Bach nould take the replace! sem 2nd sem Offe Demonstrate thorough no utcomes. Show strong a knowledge to a wide ran consistently demonstrate Demonstrate substantial outcomes. Show evidend some unfamiliar situation engagement with broad ran Demonstrate general but	his course are expected to hour HKDSE Chemistry, they are any level 2 (or above) Biomedial Biomedia Biomedia Biomedia Biomedia Biomedia Biomedia B	ave taken HKDSE Biology as encouraged to take CHEM1 dical Sciences (BBMS) or Biod. Students having taken level 2 by regular major offered by the Examination listive knowledge required for attaining all thinking, with evidence of original the situations. Apply highly effective orgament with broad range of relevant condage required for attaining at least more logical thinking, and ability to apply k. Writings mostly demonstrate informed quired for attaining most of the course lequired for	nd/or Chemistry or 041 concurrently or 041 concurrently or chemistry (BIOC) or BBMS/BIOC/MBS School of Biologica Dec May all the course learning bught, and ability to apply nizational skills. Writings bepts. st of the course learning nowledge to familiar and ad, thoughtful intellectual learning outcomes. Show	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	equivalenbefore. Not for s Bachelor course st Sciences Y 1st A B	tudents having taken of Medicine and Bach nould take the replacer. Sem 2nd sem Offe Demonstrate thorough noutcomes. Show strong a knowledge to a wide rar consistently demonstrate Demonstrate substantial outcomes. Show evidence on some unfamiliar situation engagement with broad in Demonstrate general but evidence of some analytic Apply moderately effective.	his course are expected to hour HKDSE Chemistry, they are any level 2 (or above) Biomedial programment course for BIOL1110 in an er in 2021 - 2022: Y mastery at an advanced level of externallytical and critical abilities and logical programment, thoughtful intellectual emgage command of a broad range of knowledge of analytical and critical abilities and as. Apply effective organizational skills range of relevant concepts. I incomplete command of knowledge recitical and critical abilities and logical thin we organizational skills. Writings mostly we organizational skills. Writings mostly and the programment of the	ave taken HKDSE Biology as encouraged to take CHEM1 dical Sciences (BBMS) or Biod. Students having taken level 2 by regular major offered by the Examination sive knowledge required for attaining at thinking, with evidence of original the situations. Apply highly effective original through the situations. Apply highly effective original through the situations and polity of the course logical thinking, and ability to apply k Writings mostly demonstrate informed ly undicate informed, intellectual engage to take the course ly indicate informed, intellectual engage.	nd/or Chemistry or 041 concurrently or 042 concurrently or 042 concurrently or 042 concurrently or 044 con	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	equivalenbefore. Not for s Bachelor course sh Sciences Y 1st A B	tudents having taken of Medicine and Bach hould take the replace! Sem 2nd sem Offe Demonstrate thorough no utcomes. Show strong a knowledge to a wide ran consistently demonstrate Demonstrate substantial outcomes. Show evidence some unfamiliar situation engagement with broad rependence of some analytication of the properties of the pr	his course are expected to hour HKDSE Chemistry, they are any level 2 (or above) Biomedial professional states and logical professional professional states and logical professional professional states and logical professional professional states and logical professional pr	ave taken HKDSE Biology as encouraged to take CHEM1 dical Sciences (BBMS) or Biod. Students having taken level 2 by regular major offered by the Examination sive knowledge required for attaining at thinking, with evidence of original the situations. Apply highly effective orgament with broad range of relevant condage required for attaining at least more logical thinking, and ability to apply k. Writings mostly demonstrate informed quired for attaining most of the course king, and ability to apply knowledge to y indicate informed, intellectual engagning.	nd/or Chemistry or 041 concurrently or 041 concurrently or 041 concurrently or 141 concurrently or 142 concurrently or 142 concurrently or 143 concurrently or 143 concurrently or 144 con	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	equivalenbefore. Not for s Bachelor course st Sciences Y 1st A B	tudents having taken of Medicine and Bach nould take the replacer. Sem 2nd sem Offe Demonstrate thorough noutcomes. Show strong a knowledge to a wide rar consistently demonstrate Demonstrate substantial outcomes. Show evidence some unfamiliar situation engagement with broad rough properties of some analyth Apply moderately effectifications but not always we Demonstrate partial but evidence of some coher	his course are expected to hour HKDSE Chemistry, they are any level 2 (or above) Biomedielor of Surgery (MBBS) coursement course for BIOL1110 in an er in 2021 - 2022: Yn astery at an advanced level of externanalytical and critical abilities and logical formation of a broad range of knowledge command of a broad range of knowledge of analytical and critical abilities and nas. Apply effective organizational skills ange of relevant concepts. It incomplete command of knowledge reficial and critical abilities and logical thing we organizational skills. Writings most with sufficient depth, breadth or understal limited command of knowledge requirent and logical thinking, but with limite and logical thinking, but with limite	ave taken HKDSE Biology as encouraged to take CHEM1 dical Sciences (BBMS) or Biod. Students having taken level 2 by regular major offered by the Examination sive knowledge required for attaining at thinking, with evidence of original the situations. Apply highly effective organent with broad range of relevant concluder required for attaining at least molegical thinking, and ability to apply k Writings mostly demonstrate informed king, and ability to apply knowledge to y indicate informed, intellectual engagnding. ed for attaining some of the course lead analytical and critical abilities. Showledge and control of the course lead analytical and critical abilities.	nd/or Chemistry or 041 concurrently or 042 concurrently or 042 concurrently or 042 concurrently or 044 con	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	equivalenbefore. Not for s Bachelor course sh Sciences Y 1st A B	tudents having taken of Medicine and Bach nould take the replacer sem 2nd sem Offe Demonstrate thorough noutcomes. Show strong a knowledge to a wide rar consistently demonstrate Demonstrate substantial outcomes. Show evidenc some unfamiliar situatior engagement with broad rengagement with broad re	his course are expected to hour HKDSE Chemistry, they are any level 2 (or above) Biomedial procession of Surgery (MBBS) course ment course for BIOL1110 in all and the surgery at an advanced level of externallytical and critical abilities and logical ge of complex, familiar and unfamiliar informed, thoughtful intellectual engage command of a broad range of knowledge of analytical and critical abilities and ns. Apply effective organizational skills ange of relevant concepts. Incomplete command of knowledge recical and critical abilities and logical thin ve organizational skills. Writings most with sufficient depth, breadth or understa limited command of knowledge requirent and logical thinking, but with limite oblems. Apply limited or barely effective processing the sufficient of the sufficient	ave taken HKDSE Biology as e encouraged to take CHEM1 dical Sciences (BBMS) or Biod. Students having taken level 2 by regular major offered by the Examination nd/or Chemistry or 041 concurrently or 042 concurrently or 042 concurrently or 042 concurrently or 044 con		
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(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	equivalent before. Not for s Bachelor course sh Sciences Y 1st A B C	tudents having taken of Medicine and Bach nould take the replacer. Sem 2nd sem Offe Demonstrate thorough noutcomes. Show strong a knowledge to a wide ran consistently demonstrate Demonstrate substantial outcomes. Show evidence of some unfamiliar situation engagement with broad in Demonstrate general but evidence of some analytication and proposed partial but evidence of some coher knowledge to solve proposed prop	his course are expected to hour HKDSE Chemistry, they are any level 2 (or above) Biomedial properties of Surgery (MBBS) course ment course for BIOL1110 in an are in 2021 - 2022: Y mastery at an advanced level of externallytical and critical abilities and logical go of complex, familiar and unfamiliar informed, thoughtful intellectual engage command of a broad range of knowledge of analytical and critical abilities and ns. Apply effective organizational skills aringe of relevant concepts. It incomplete command of knowledge reical and critical abilities and logical thin ve organizational skills. Writings most ith sufficient depth, breadth or understal limited command of knowledge requirent and logical thinking, but with limit bollems. Apply limited or barely effects or theories but mostly at a superficial evidence of command of knowledge lities, logical and coherent thinking. Shominimally effective or ineffective. Writin	ave taken HKDSE Biology as e encouraged to take CHEM1 dical Sciences (BBMS) or Biod. Students having taken level 2 by regular major offered by the Examination nd/or Chemistry or 041 concurrently or 041 concurrently or 041 concurrently or 041 concurrently or 141 concurrently or 152 concurrently or 153 concurrently or 153 concurrently or 154 concurrently or 154 concurrently or 155 con		
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and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching & Learning Activities	equivalence before. Not for separate s	tudents having taken of Medicine and Bach hould take the replace! Sem 2nd sem Offe Demonstrate thorough noutcomes. Show strong a knowledge to a wide ran consistently demonstrate Demonstrate substantial outcomes. Show evidend some unfamiliar situation engagement with broad noutcomes. Show evidend some unfamiliar situation engagement with broad the vidence of some analytical particulation of some coher knowledge to solve progragement with concep Demonstrate little or no analytical and critical abil organizational skills are or theories. Writings are in assed course / Self study	any level 2 (or above) Biomer lelor of Surgery (MBBS) course. In a course of Surgery (MBBS) course. In a course of BIOL1110 in an er in 2021 - 2022: Yes mestery at an advanced level of externanalytical and critical abilities and logicar of complex, familiar and unfamiliar informed, thoughtful intellectual engage command of a broad range of knowledge of analytical and critical abilities and ins. Apply effective organizational skills ange of relevant concepts. In incomplete command of knowledge relical and critical abilities and logical thin ve organizational skills. Writings most with sufficient depth, breadth or understal limited command of knowledge requirent and logical thinking, but with limite oblems. Apply limited or barely effect or theories but mostly at a superficial evidence of command of knowledge litties, logical and coherent thinking. She minimally effective or ineffective. Writin irrelevant or superficial.	ave taken HKDSE Biology as encouraged to take CHEM1 dical Sciences (BBMS) or Biod. Students having taken level 2 by regular major offered by the Examination sive knowledge required for attaining at thinking, with evidence of original the situations. Apply highly effective orgament with broad range of relevant condage required for attaining at least more logical thinking, and ability to apply k. Writings mostly demonstrate informed with a course lead analytical and critical abilities. Short ive organizational skills. Writings inclevel. required for attaining the course lead analytical and critical abilities. Short ive organizational skills. Writings inclevel. required for attaining the course lead analytical and critical abilities. Short ive organizational skills. Writings inclevel. required for attaining the course lead analytical and critical abilities. Short ive organizational skills writings inclevel. Weighting in final course grade (%) Weighting in final course grade (%)	nd/or Chemistry or 041 concurrently or 042 concurrently or 042 concurrently or 043 concurrently or 044 con	

BIOL1111	Introductory microbiology (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	80
Course Co-ordinator	, Biological Sciences ()		
Teachers Involved	(,Biological Sciences)		
Course Objectives	To introduce students to the diversity and function of microorganisms; and re natural environment, disease and public health, food production and spoilage an		
Course Contents	Evolutionary diversity of bacteria, archaea, eukarya and viruses; Metabolic str	ategies, cell biolo	gy and genetics;

& Topics	Microbial ecology, marine microbiology, terrestrial microbiology; Microbial interactions with animals and plants; The human microbiome; Medical microbiology and immunology; Biotechnology applications; Food spoilage and food fermentations.					
Course Learning	On succes	On successful completion of this course, students should be able to:				
Outcomes	CLO 1 de	scribe the key features of	of the major microbial phyla ar	nd place them in an evolutional	y context	
			gical and genetic processes in d differences between these t	n prokaryotes and eukaryotic two domains	microorganisms and	
		entify the microorganism od production and spoila		cological processes, human dis	sease and medicine,	
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL					
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : N		Examination		
Grade Descriptors (A+ to F)	A	reading or research is evide		essed. Organization of ideas and clarit erstanding of concepts. Arguments a is highly creative and appealing.		
	B (70-84%) Approaches the standard of excellence. All criteria are addressed. Organization of ideas and clarity are very good. Ideas show a complete understanding of concepts. Arguments are persuasive and prioritize major issues. Presentation is creative and appealing.					
	C (55-69%) Meets an acceptable standard. All criteria are addressed. Organization of ideas and clarity are sufficient. Ideas show an effective understanding of concepts. Arguments identify major issues. Presentation is appealing but may lack clarity.					
	(45-54%) Below acceptable standard. Most criteria are addressed. Organization of ideas and clarity are weak. Ideas show an incomplete understanding of concepts. Arguments are not persuasive. Presentation lacks creativity or is not appealing.					
	Fail	(<45%) Unacceptable. Inabi understanding of concepts. N	lity to identify major criteria. Very v lo coherent argument. Presentation la	veak organization of ideas and clarit acks creativity or is unappealing.	y. Ideas show a lack of	
Course Type	Lecture wi	th laboratory component	course			
Course Teaching	Activities	, <u>'</u>	Details		No. of Hours	
& Learning Activities	Lectures				24	
_	Laborator	v			24	
	Tutorials	,			6	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods	,	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examinat	ion		70	CLO 1,2,3	
	Laborator	y reports		30	CLO 3	
Required/recommended reading and online materials			, Pearson Benjamin Cummin	ngs, 12th Edition, 2009 [HKU		
Course Website	http://moo	dle.hku.hk/				

BIOL1201	Introdu	iction to food and nut	rition (6 credits)	Academic Year	2020
Offering Department	Biologica	al Sciences	•	Quota	150
Course Co-ordinator	Dr L Zha	ing, Biological Sciences (Iz	hang17@hku.hk)		
Teachers Involved	(Dr J C Y Lee,Biological Sciences) (Dr L Zhang,Biological Sciences) (Dr T C S Lam,Biological Sciences)				
Course Objectives	To enable student to appreciate the multidisciplinary nature in the study of Food and Nutrition. From the farmer's field to the dinner table, a basic understanding of the general properties of food in production, processing, storage and safety, as well as food security will be covered. Basic macro- and micronutrients from these food and its absorption, distribution, metabolism, and excretion will allow students to understand the function of these nutrients in the human body. This is an independent course which can be taken by students from various disciplines. It also prepares students for further studies in Food and Nutritional Science.				
Course Contents & Topics		nd regulation; food securi		of major nutrients; food additivend practice; essential nutrients;	
Course Learning	On succe	essful completion of this co	ourse, students should be able	to:	
Outcomes	CLO 2 CLO 3	understand the significand understand the concept o	ce of food safety and be able to	discuss their functional properties of identify sources of contamination	
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL	The state of the s			
Offer in 2020 - 2021	Y 1s	st sem Offer in 2021 - 202	22 · Y	Examination	Б
Oner in 2020 - 2021	A Demonstrate thorough grasp of the subject matter covered. Show exceptional ability to articulate concepts and integrate knowledge. Demonstrate highly effective organization / writing skills.				
		knowledge. Demonstrate high	p of the subject matter covered. Shally effective organization / writing skills	i	
Grade Descriptors	В	knowledge. Demonstrate high Demonstrate substantial grass the materials to solve probler	p of the subject matter covered. Shally effective organization / writing skills sp of the subject matter covered. Showns. Demonstrate effective organization	s. v full capacity to use the appropriate cor r / writing skills.	ncepts and integrate
Grade Descriptors	В	knowledge. Demonstrate higi Demonstrate substantial gras the materials to solve probler Demonstrate general but in problems. Demonstrate adeq	p of the subject matter covered. Shally effective organization / writing skills sp of the subject matter covered. Shoms. Demonstrate effective organization complete grasp of the subject matte uate organization / writing skills.	w full capacity to use the appropriate cor I / writing skills. r covered. Show ability to apply conce	ncepts and integrate ncepts and assimilate epts to solve simple
Grade Descriptors	В	knowledge. Demonstrate higi Demonstrate substantial gras the materials to solve probler Demonstrate general but in problems. Demonstrate adeq Demonstrate partial but lir Misunderstanding of the mate basic organization / writing sk	p of the subject matter covered. Shally effective organization / writing skills por the subject matter covered. Showns. Demonstrate effective organization complete grasp of the subject matter uate organization / writing skills. mited grasp, with retention of son grials is not uncommon. Ability to applicitle.	w full capacity to use the appropriate cor // writing skills. r covered. Show ability to apply conce the relevant information, of the subject y concepts and solve simple problems is	ncepts and integrate ncepts and assimilate epts to solve simple ct matter covered. limited. Demonstrate
Grade Descriptors	В	knowledge. Demonstrate higi Demonstrate substantial gras the materials to solve probler Demonstrate general but iin problems. Demonstrate adeq Demonstrate partial but lir Misunderstanding of the mate basic organization / writing sk Demonstrate little or no gras	p of the subject matter covered. Shally effective organization / writing skills sp of the subject matter covered. Shoms. Demonstrate effective organization complete grasp of the subject matte uate organization / writing skills. mited grasp, with retention of son erials is not uncommon. Ability to applicible.	w full capacity to use the appropriate cor I writing skills. r covered. Show ability to apply concern re relevant information, of the subject	ncepts and integrate ncepts and assimilate epts to solve simple ct matter covered. limited. Demonstrate f. Fail to understand
Grade Descriptors (A+ to F) Course Type	B C D	knowledge. Demonstrate higi Demonstrate substantial gras the materials to solve probler Demonstrate general but iin problems. Demonstrate adeq Demonstrate partial but lir Misunderstanding of the mate basic organization / writing sk Demonstrate little or no gras	p of the subject matter covered. Shally effective organization / writing skills sp of the subject matter covered. Shoms. Demonstrate effective organization complete grasp of the subject matte uate organization / writing skills. mited grasp, with retention of son erials is not uncommon. Ability to applicible.	w full capacity to use the appropriate cor 1 / writing skills. r covered. Show ability to apply conce ne relevant information, of the subject y concepts and solve simple problems is cormation, of the subject matter covered	ncepts and integrate ncepts and assimilate epts to solve simple ct matter covered. limited. Demonstrate f. Fail to understand
Grade Descriptors	B C D	knowledge. Demonstrate high Demonstrate substantial gras the materials to solve probler Demonstrate general but in problems. Demonstrate adeq Demonstrate partial but lir Misunderstanding of the material basic organization / writing sk Demonstrate little or no graconcepts and show minimal obased course	p of the subject matter covered. Shally effective organization / writing skills sp of the subject matter covered. Shoms. Demonstrate effective organization complete grasp of the subject matte uate organization / writing skills. mited grasp, with retention of son erials is not uncommon. Ability to applicible.	w full capacity to use the appropriate cor 1 / writing skills. r covered. Show ability to apply conce ne relevant information, of the subject y concepts and solve simple problems is cormation, of the subject matter covered	ncepts and integrate ncepts and assimilate epts to solve simple ct matter covered. limited. Demonstrate f. Fail to understand

	Tutorials	student-centered learning		12		
	Reading / Self study			100		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		50	CLO 1,2,3,4		
	Examination		50	CLO 1,2,3,4		
Required/recommended reading and online materials	Essentials of Human Nutrition, Fift Brown A. Understanding Food: Pri	Fennema's Food Chemistry, Fifth Edition, CRC Press (2017) Essentials of Human Nutrition, Fifth Edition, Oxford(2017) Brown A. Understanding Food: Principles and Preparation. Wadsworth, Cengage Learning, 2011 Hotchkiss J.H. & Porter N.N. Food Science. Chapman & Hall, 1995				
Course Website	http://moodle.hku.hk/					

BIOL1309	Evolutio	nary diversity (6 c	redits)		Academic Year	2020
Offering Department	Biological		•		Quota	250
Course Co-ordinator			Sciences (saunders@hku	ı.hk)		
Teachers Involved	(Dr C Schunter,Biological Sciences) (Dr M Yasuhara,Biological Sciences) (Dr S Cannicci,Biological Sciences) (Prof R M K Saunders,Biological Sciences)					
Course Objectives	To provide fundamen used as the	To provide students with an introduction to the diversity of plant and animal life. Recent research has resulted in fundamental changes in our understanding of evolutionary history (phylogeny). Current evolutionary trees will be used as the basis for a survey of different groups in phylogenetic sequence, and for understanding how structures processes and behaviours have changed through time.				
Course Contents & Topics	(Rhodoph seedless Ginkgophy Mollusca, (Batracho	Introduction to the methodology for reconstructing the sequence of past evolutionary events (cladistics); algae (Rhodophyta, Phaeophyta and Chlorophyta); non-vascular plants (Hepatophyta, Anthocerophyta and Bryophyta); seedless vascular plants (Lycophyta, Psilophyta, Sphenophyta and Pterophyta); seed plants (Cycadophyta, Ginkgophyta, Coniferophyta, Gnetophyta and Anthophyta); invertebrates (Cnidaria, Platyhelminthes, Annelida, Mollusca, Nematoda, Arthropoda and Echinodermata); fish (Chondrichthyes and Actinopterygii); amphibians (Batrachomorpha); reptiles (Anapsida, Lepidosauromorpha and Archosauromorpha); and mammals (Monotremata, Metatheria and Eutheria).				
Course Learning Outcomes	On succes CLO 1 int ev CLO 2 de	esful completion of this terpret phylogenies in volutionary changes in se escribe the characterist e main taxonomic grou	course, students should be order to understand the structures, processes and ics of different evolutionary ps ctive advantages of the high	relatedness of taxo behaviours y lineages of plants a	nd animals and re	call the names of
	02000	pidiri trio poddibio ddio	oute autamages of the m	gringritoa otraotaroo, p	processe and ber	ia vicaro
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL					
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	Y 2nd	I sem Offer in 2021 -			Examination	Мау
(and Co-requisites and Impermissible	Y 2nd	Demonstrate thorough ma learning outcomes, with e Apply highly effective pres	astery at an advanced level of extensive use of named example entation skills.	es. Show evidence of sign	ired for attaining most nificant critical abilities	t or all of the course and logical thinking.
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 2nd	Demonstrate thorough ma learning outcomes, with e Apply highly effective press Demonstrate substantial c named examples. Show ev Demonstrate general but	astery at an advanced level of extensive use of named example entation skills. oommand of knowledge required vidence of critical abilities and log incomplete command of knowledge recommend.	es. Show evidence of sign for attaining most of the c gical thinking. Apply effectived ledge and skills required	irred for attaining most inficant critical abilities course learning outcom- ve presentation skills. for attaining most of	t or all of the course and logical thinking nes, with some use o the course learning
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 2nd A B C	Demonstrate thorough ma learning outcomes, with e Apply highly effective press Demonstrate substantial on named examples. Show evanties outcomes, with only limit moderately effective prese	astery at an advanced level of extensive use of named example entation skills. ommand of knowledge required vidence of critical abilities and log incomplete command of knowled use of named examples. Sometimes of the control of the	es. Show evidence of sign for attaining most of the c gical thinking. Apply effectively ledge and skills required how evidence of some of	ired for attaining most nificant critical abilities course learning outcome ve presentation skills. for attaining most of critical abilities and lo	t or all of the course and logical thinking. nes, with some use o the course learning gical thinking. Apply
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 2nd	Demonstrate thorough malearning outcomes, with e Apply highly effective press Demonstrate substantial c named examples. Show ex Demonstrate general but outcomes, with only limit moderately effective prese Demonstrate partial but limit and provided the control of the control o	astery at an advanced level of extensive use of named example entation skills. ommand of knowledge required widence of critical abilities and log incomplete command of knowled use of named examples. S	es. Show evidence of sign for attaining most of the c gical thinking. Apply effective ledge and skills required how evidence of some conditions attain	ired for attaining mosi inficant critical abilities course learning outcome ve presentation skills. for attaining most of critical abilities and louing some of the cours	t or all of the course and logical thinking. nes, with some use o the course learning gical thinking. Apply se learning outcomes
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 2nd A B C	Demonstrate thorough ma learning outcomes, with e Apply highly effective press Demonstrate substantial on named examples. Show endoutcomes, with only limit moderately effective prese Demonstrate partial but lir with insufficient use of nan skills. Demonstrate little or no e	astery at an advanced level of extensive use of named example entation skills. ommand of knowledge required vidence of critical abilities and log incomplete command of knowled use of named examples. Sintation skills. mited command of knowledge arned examples. Show evidence of command of knowledge arned examples. Show little or no evidence or strength of the streng	es. Show evidence of sign for attaining most of the c gical thinking. Apply effectivedge and skills required how evidence of some cond skills required for attain filmited critical abilities and edge and skills required for	ired for attaining most inficant critical abilities course learning outcome ve presentation skills. for attaining most of critical abilities and lo logical thinking. Apploor attaining the course	t or all of the course and logical thinking. hes, with some use of the course learning gical thinking. Apply se learning outcomes by limited presentation se learning outcomes,
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Y 2nd A B C D Fail	Demonstrate thorough malearning outcomes, with e Apply highly effective press Demonstrate substantial c named examples. Show e Demonstrate general but outcomes, with only limit moderately effective prese Demonstrate partial but limit insufficient use of nan skills. Demonstrate little or no e without use of named examinimally effective or ineffetth laboratory compone	astery at an advanced level of extensive use of named example entation skills. ommand of knowledge required vidence of critical abilities and log incomplete command of knowledge so f named examples. Sintation skills. mited command of knowledge are need examples. Show evidence of command of knowledge armoles. Show little or no evide excive.	es. Show evidence of sign for attaining most of the c gical thinking. Apply effectivedge and skills required how evidence of some cond skills required for attain f limited critical abilities and	ired for attaining most inficant critical abilities course learning outcome ve presentation skills. for attaining most of critical abilities and lo logical thinking. Apploor attaining the course	t or all of the course and logical thinking nes, with some use of the course learning gical thinking. Apply se learning outcomes by limited presentation at learning outcomes, seentational skills are
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Y 2nd A B C D	Demonstrate thorough malearning outcomes, with e Apply highly effective press Demonstrate substantial c named examples. Show e Demonstrate general but outcomes, with only limit moderately effective prese Demonstrate partial but limit insufficient use of nan skills. Demonstrate little or no e without use of named examinimally effective or ineffetth laboratory compone	astery at an advanced level of extensive use of named example entation skills. ommand of knowledge required vidence of critical abilities and log incomplete command of knowled use of named examples. Sintation skills. interest command of knowledge are need examples. Show evidence of command of knowledge armoles. Show little or no evide amples. Show little or no evide ective.	es. Show evidence of sign for attaining most of the c gical thinking. Apply effectivedge and skills required how evidence of some cond skills required for attain f limited critical abilities and	ired for attaining most inficant critical abilities course learning outcome ve presentation skills. for attaining most of critical abilities and lo logical thinking. Apploor attaining the course	t or all of the course and logical thinking nes, with some use of the course learning gical thinking. Apply se learning outcomes by limited presentation at learning outcomes, essentational skills are
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Y 2nd A B C D Fail Lecture wi Activities Lectures	Demonstrate thorough malearning outcomes, with elarning outcomes, with elarning outcomes, with elarning outcomes. Show expensive several period of the properties of the prope	astery at an advanced level of extensive use of named example entation skills. ommand of knowledge required vidence of critical abilities and log incomplete command of knowledge so f named examples. Sintation skills. mited command of knowledge are need examples. Show evidence of command of knowledge armoles. Show little or no evide excive.	es. Show evidence of sign for attaining most of the c gical thinking. Apply effectivedge and skills required how evidence of some cond skills required for attain f limited critical abilities and	ired for attaining most inficant critical abilities course learning outcome ve presentation skills. for attaining most of critical abilities and lo logical thinking. Apploor attaining the course	t or all of the course and logical thinking hes, with some use of the course learning gical thinking. Apply see learning outcomes by limited presentation a learning outcomes, essentational skills are the course of the course o
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Y 2nd A B C D Fail Lecture wi Activities Lectures Laborator	Demonstrate thorough malearning outcomes, with elarning outcomes, with elarning outcomes, with elarning outcomes. Demonstrate substantial on named examples. Show evaluation of the substantial on the substantial of the substantial outcomes, with only limit moderately effective prese Demonstrate partial but limit with insufficient use of nan skills. Demonstrate little or no elavithout use of named examinimally effective or ineffectifith laboratory compone	astery at an advanced level of extensive use of named example entation skills. ommand of knowledge required vidence of critical abilities and log incomplete command of knowledge so f named examples. Sintation skills. mited command of knowledge are need examples. Show evidence of command of knowledge armoles. Show little or no evide excive.	es. Show evidence of sign for attaining most of the c gical thinking. Apply effectivedge and skills required how evidence of some cond skills required for attain f limited critical abilities and	ired for attaining most inficant critical abilities course learning outcome ve presentation skills. for attaining most of critical abilities and lo logical thinking. Apploor attaining the course	t or all of the course and logical thinking hes, with some use of the course learning gical thinking. Apply se learning outcomes by limited presentation a learning outcomes, sentational skills are the course of t
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Y 2nd A B C D Fail Lecture wi Activities Lectures Laborator	Demonstrate thorough malearning outcomes, with elarning outcomes, with elarning outcomes, with elarning outcomes. Show expensive several period of the properties of the prope	astery at an advanced level of extensive use of named example entation skills. ommand of knowledge required vidence of critical abilities and log incomplete command of knowledge so f named examples. Sintation skills. mited command of knowledge are need examples. Show evidence of command of knowledge armoles. Show little or no evide excive.	es. Show evidence of sign for attaining most of the c gical thinking. Apply effectivedge and skills required how evidence of some cond skills required for attain f limited critical abilities and	ired for attaining most inficant critical abilities course learning outcome ve presentation skills. for attaining most of critical abilities and lo logical thinking. Apploor attaining the course	t or all of the course and logical thinking hes, with some use of the course learning gical thinking. Apply see learning outcomes by limited presentation a learning outcomes, essentational skills are the course of the course o
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching & Learning Activities Assessment Methods	Y 2nd A B C D Fail Lecture wi Activities Lectures Laborator Reading / Methods	Demonstrate thorough malearning outcomes, with elarning outcomes, with elarning outcomes, with elarning outcomes, with oldender and examples. Show expended the content of the content of the content outcomes, with only limit moderately effective prese demonstrate partial but lir with insufficient use of nanskills. Demonstrate little or no ewithout use of named examinimally effective or ineffectifith laboratory compone in the content of the content of the content of the content of the content outcomes.	astery at an advanced level of extensive use of named example entation skills. ommand of knowledge required vidence of critical abilities and log incomplete command of knowledge so f named examples. Sintation skills. mited command of knowledge are need examples. Show evidence of command of knowledge armoles. Show little or no evide excive.	es. Show evidence of sign for attaining most of the cigical thinking. Apply effective dege and skills required how evidence of some cond skills required for attain filmited critical abilities an edge and skills required for action of critical abilities and edge and skills required for action of critical abilities and the condition of critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abiliti	ired for attaining most inficant critical abilities course learning outcome presentation skills. for attaining most of critical abilities and low ing some of the course dogical thinking. Applor attaining the course dogical thinking. Presenting in final the grade (%)	t or all of the course and logical thinking. The course learning gical thinking. Apply the learning outcomes by limited presentation are learning outcomes. The course learning outcomes is elearning outcomes, is elearning outcomes, is entational skills are course. No. of Hours 24 36 100 Assessment Methods to CLO Mapping
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching & Learning Activities Assessment Methods	Y 2nd A B C D Fail Lecture wi Activities Lectures Laborator Reading /	Demonstrate thorough malearning outcomes, with elarning outcomes, with elarning outcomes, with elarning outcomes, with oldender and examples. Show expended the content of the content of the content outcomes, with only limit moderately effective prese demonstrate partial but lir with insufficient use of nanskills. Demonstrate little or no ewithout use of named examinimally effective or ineffectifith laboratory compone in the content of the content of the content of the content of the content outcomes.	astery at an advanced level of extensive use of named example entation skills. ommand of knowledge required vidence of critical abilities and log incomplete command of knowledge sed use of named examples. Sintation skills. nited command of knowledge are examples. Show evidence of command of knowledge are examples. Show evidence of exidence of command of knowledge amples. Show little or no evide ective. Int course Details	es. Show evidence of sign for attaining most of the cigical thinking. Apply effective dege and skills required how evidence of some cond skills required for attain filmited critical abilities an edge and skills required for action of critical abilities and edge and skills required for action of critical abilities and the condition of critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abiliti	ired for attaining mosinificant critical abilities course learning outcome presentation skills. for attaining most of critical abilities and lower presentation skills and lower produced the course of logical thinking. Applior attaining the course of logical thinking. Presenting in final the grade (%)	t or all of the course and logical thinking hes, with some use of the course learning gical thinking. Apply se learning outcomes by limited presentation are learning outcomes, essentational skills are to the course seems and the course seems are the course of the cour
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Y 2nd A B C D Fail Lecture wi Activities Lectures Laborator Reading / Methods	Demonstrate thorough malearning outcomes, with e Apply highly effective press Demonstrate substantial c named examples. Show ev Demonstrate general but outcomes, with only limit moderately effective press Demonstrate partial but lim with insufficient use of nan skills. Demonstrate little or no e without use of named examinimally effective or ineffective or ineffe	astery at an advanced level of extensive use of named example entation skills. ommand of knowledge required vidence of critical abilities and log incomplete command of knowledge sed use of named examples. Sintation skills. nited command of knowledge are examples. Show evidence of command of knowledge are examples. Show evidence of exidence of command of knowledge amples. Show little or no evide ective. Int course Details	es. Show evidence of sign for attaining most of the cigical thinking. Apply effective dege and skills required how evidence of some cond skills required for attain filmited critical abilities an edge and skills required for action of critical abilities and edge and skills required for action of critical abilities and the condition of critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abilities and critical abiliti	ired for attaining most inficant critical abilities course learning outcome presentation skills. for attaining most of critical abilities and low ing some of the course dogical thinking. Applor attaining the course dogical thinking. Presenting in final the grade (%)	t or all of the course and logical thinking. The course learning gical thinking. Apply the learning outcomes by limited presentation are learning outcomes. The course learning outcomes is elearning outcomes, is elearning outcomes, is entational skills are course. No. of Hours 24 36 100 Assessment Methods to CLO Mapping
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching & Learning Activities Assessment Methods	Y 2nd A B C D Fail Lecture wi Activities Lectures Laborator Reading / Methods Examinat Laborator P. H. Rave	Demonstrate thorough malearning outcomes, with e Apply highly effective press Demonstrate substantial c named examples. Show ev Demonstrate general but outcomes, with only limit moderately effective prese Demonstrate partial but limit misufficient use of nan skills. Demonstrate little or no e without use of named examinimally effective or inefficient laboratory compone it laboratory compone is self-study	astery at an advanced level of extensive use of named example entation skills. ommand of knowledge required vidence of critical abilities and log incomplete command of knowledge sed use of named examples. Sintation skills. nited command of knowledge are examples. Show evidence of command of knowledge are examples. Show evidence of exidence of command of knowledge amples. Show little or no evide ective. Int course Details	es. Show evidence of sign for attaining most of the cigical thinking. Apply effective dege and skills required how evidence of some of the condition of the con	ired for attaining mosinificant critical abilities course learning outcome presentation skills. for attaining most of critical abilities and loud in the course discourse presentation skills. For attaining most of critical abilities and loud in the course discourse d	t or all of the course and logical thinking hes, with some use of the course learning gical thinking. Apply se learning outcomes by limited presentation as learning outcomes, essentational skills are to the course sentational skills are to the course sentation to the course sentati

BIOL1501	Bioethics (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	40
Course Co-ordinator	, Biological Sciences ()		
Teachers Involved	(,Biological Sciences)		
Course Objectives	The aim is to explore the ethical implications of the latest major advances in biol	ogy and medicine	
Course Contents & Topics	The course will discuss research ethic between student and mentor, and et advancements in biological and medical sciences. Major areas to be discuss genetics, reproduction, disease diagnosis and therapy, development, transplar and the use of animals in research. Ethical and moral principles and implication policy raised by these advances will be discussed.	sed include but a ntation, aging, dyi	re not limited to:

Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 familiarize with the current ethical theories, discussions, and arguments taking place in the field of bioethics specifically related to the advancement of modern molecular biology and genomics						
	CLO 2 reflect upon and formulate in a professional manner their own opinions on these matters as well as to understand and enter into a respectful dialogue with those who possess another point of view						
	CLO 3 u	nderstand the basis of on	e's own position, as well as the basis	of another person's opin	nion		
	CLO 4 deal with the quandaries that arise when facing modern medical technology and advancements						
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL						
Offer in 2020 - 2021	N Off	N Offer in 2021 - 2022 : N Examination					
Grade Descriptors (A+ to F)	A Demonstrate thorough grasp of the subject matter covered. Show strong analytical and critical abilities and logical thinking, with evidence of creative ability and competence in professional-level problem solving. Critically use communication skills and techniques and analysis of data and results to draw appropriate and insightful conclusions to real-world problems. Demonstrate highly effective individual as well as collaborative-based organizational and presentational skills.						
	В	Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities and logical thinking with some evidence of competence in professional-level problem solving. Use communication skills and techniques and analysis of data and results to draw generally appropriate conclusions to real-world problems. Demonstrate effective individual as well as collaborative-based organizational and presentational skills.					
	Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of analytical and critical abilities and logical thinking with limited competence in professional-level problem solving. Use communication skills and techniques and analysis of data and results to draw moderately appropriate but sometimes erroneous conclusions to real-world problems. Demonstrate moderately individual as well as collaborative-based organizational and presentational skills.						
	D	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Show some evidence of coherent and logical thinking, but lacking competence in professional-level problem solving. Use communication skills and techniques and analysis of data and results to draw sometimes appropriate but often erroneous conclusions to real world problems. Demonstrate individual as well as collaborative-based organizational and presentational skills of limited effectiveness.					
	Fail Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Show lack of countries and logical thinking, and minimal competence in professional-level problem solving. Use communication skills and tech and analysis of data and results ineffectively, leading generally to inappropriate and usually erroneous conclusions to reproblems. Demonstrate ineffectiveness individual as well as collaborative-based organizational and presentational skills.				on skills and techniques conclusions to real-world		
Course Type	Lecture-based course						
Course Teaching	Activities		Details	No. of Hours			
& Learning Activities	Lectures				36		
	Tutorials				12		
	Assessment				100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		continuous assessment of essays, presentation and debate exercises	60	CLO 1,2,3,4		
	Examination			40	CLO 1,2,3,4		
Required/recommended reading and online materials	NIL Library & web-based reading materials						
Additional Course Information	This cour	se will be offered subject	to a minimum enrollment number and	d availability of teachers.			

BIOL1502	The gene	e (6 credits)			Academic Year	2020
Offering Department	Biological	Sciences			Quota	50
Course Co-ordinator	, Biologi	cal Sciences ()				
Teachers Involved	(,Biologi	cal Sciences)				
Course Objectives	The objective is to expose students to the impacts of genes to the society. Recent completion of the human genome and many agricultural crops and animals genomes, it brings not only promises of a better quality of life as well as lots of technical and ethical issues/challenges that general public need to deal with. The goal of this course is to open up students from all backgrounds to this basic unit of inheritance called the gene and its impact or various scientific and social disciplines.					
Course Contents & Topics	Content/topics include: Introduction and review of basic cell biology Basic genetic - The gene Basic Molecular Biology and Biotechnology - Recombinant DNA and cloning Bacterial Genes - Gene and Environment Human Genes/Human genome - history and its Impacts! Human Genome - The Amazing discovery! Genes and Biotechnology Genes and Disease Genes and Cancer Animal and Plant Cloning Genes and Agricultural/Food Biotechnology					
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 demonstrate understanding and to explain the principle of inheritance, recombinant DNA and cloning CLO 2 gain deep understanding about the advancement of biotechnology CLO 3 determine and explain the benefits and shortcomings of the application of biotechnology knowledge					
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL	udents with level		E Biology or Combined So		
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : N	N		Examination	
Grade Descriptors (A+ to F)	A	evidence of creative	ability and competence in	er covered. Show strong analytical a professional-level problem solving aw appropriate and insightful concl	g. Critically use comm	nunication skills and

		highly effective individual as	s well as collaborative-based organizational a	ind presentational skills.			
	B Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities and logical thinking with some evidence of competence in professional-level problem solving. Use communication skills and techniques and analysis of data and results to draw generally appropriate conclusions to real-world problems. Demonstrate effective individual as well as collaborative-based organizational and presentational skills.						
	C Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of analytical and critical abilities and logical thinking with limited competence in professional-level problem solving. Use communication skills and techniques and analysis of data and results to draw moderately appropriate but sometimes erroneous conclusions to real-world problems. Demonstrate moderately individual as well as collaborative-based organizational and presentational skills. Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Show some evidence of coherent and logical thinking, but lacking competence in professional-level problem solving. Use communication skills and techniques and analysis of data and results to draw sometimes appropriate but often erroneous conclusions to real-world problems. Demonstrate individual as well as collaborative-based organizational and presentational skills of limited effectiveness.						
	Fail	and logical thinking, and mand analysis of data and re	asp, with retention of little relevant information ininimal competence in professional-level proseults ineffectively, leading generally to inapp ffectiveness individual as well as collaborativ	blem solving. Use communicat ropriate and usually erroneous	ion skills and techniques conclusions to real-world		
Course Type	Lecture-based course						
Course Teaching & Learning Activities	Activities		Details	No. of Hours			
	Lectures				36		
	Tutorials			12			
	Reading / Self study		including 45 hours on 15 es presentation (include preparation)	93			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		discussion forum	35	CLO 1,2,3		
	Essay		essays & written reports	25	CLO 1,2,3		
	Presentation		poster & oral presentation	30	CLO 1,2,3		
	Test		in-class participation & quizzes	10	CLO 1,2,3		
Required/recommended reading and online materials	Library & web-based reading materials						
Additional Course Information	This course will be offered subject to a minimum enrollment number and availability of teachers.						

BIOL2101	Princip	les of food chemis	stry (6 credits)	Academic Ye	ear 2020		
Offering Department	Biological Sciences Quota				100		
Course Co-ordinator	Dr J C Y	Lee, Biological Science	es (jettylee@hku.hk)				
Teachers Involved	(Dr J C Y Lee, School of Biological Sciences)						
	(Dr T C S Lam, School of Biological Sciences)						
Course Objectives	To provide a basic understanding of chemistry in food systems, and to provide practical training in chemistry						
	related to food science and nutrition.						
Course Contents	The course will cover the components of food, including water, proteins, carbohydrates and lipids, and mi						
& Topics	components such as enzymes, vitamins, minerals, colorants, flavorants and additives. The physical and chemica						
				ed in detail, and form the basis f			
		•		rage and handling of foods, and	in understanding the		
		used in analyzing food					
Course Learning	On successful completion of this course, students should be able to: CLO 1 understand the functions and properties of major and minor food components						
Outcomes			,				
	CLO 2 understand the basic chemistry behind food processing						
			chemical and biochemical read				
	CLO 4 have integrated their knowledge of biological and chemical principles into a food science and nutrition						
		context		DIOL 000 t			
Pre-requisites	Pass in BIOL1201; and NOT for students who have passed in BIOL3201. The course is only for students admitted in 2017-2018 or thereafter.						
(and Co-requisites							
and Impermissible							
combinations) Offer in 2020 - 2021	Y 1s	st sem Offer in 2021 -	2022 · V	Examination	Dec		
Grade Descriptors (A+ to F)	Demonstrate thorough grasp of the subject matter covered. Show extensive knowledge and understanding of the topics covered and can readily apply this knowledge. Critically use lab skills and techniques and analysis of data and results to draw appropriate and insightful conclusions.						
	В	B Demonstrate substantial grasp of the subject matter covered. Show thorough knowledge and understanding of the content and a high level of competence in the topics covered and able to apply this knowledge and skills to most situations. Use lab skills and techniques and analysis of data and results to draw generally appropriate conclusions.					
	С						
	D	skills and techniques and analysis of data and results to draw moderately appropriate conclusions. Demonstrate partial but limited grasp, with retention of some relevant information of the subject matter covered. Show a basic					
	knowledge and understanding of the content and has achieved a limited level of competence in the topics covered. Use lab skills and techniques and analysis of data and results to draw appropriate conclusions occasionally.						
	Fail Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Show elementary knowledge and understanding in few areas of the content and has achieved very limited competence in some of the topics						
	covered. Use lab skills and techniques and analysis of data and results ineffectively, leading generally to inappropriate and						
		usually erroneous conclu	usions.				
Course Type	Lecture \	with laboratory compor	nent course				
Course Teaching & Learning Activities	Activities		Details	Details			
	Lectures				24		
	Laboratory				36		
	Reading / Self study						
	Reading	g / Self study			100		
	Reading Method	•	Details	Weighting in final course grade (%)	Assessment Methods		
Assessment Methods and Weighting		s	Details Laboratory		Assessment		

	Examination		40	CLO 1,2,3,4			
	Test		40	CLO 1,2,3,4			
Required/recommended reading and online materials		Fennema OR, Food Chemistry (Marcel Dekker 4th Ed, 2008) Belitz HD, Grosch W, Schieberle, P, Food Chemistry (Springer 4th Ed, 2009)					
Course Website	http://moodle.hku.hk						
Additional Course	The course will be offered subject to a minimum enrollment number and availability of teachers						
Information	Lab. A (Quota: 50): 14:30 pm - 18: Lab. B (Quota 50): 13:30 pm - 17:		•				

BIOL2102	Biostatis	stics (6 credits)		Academic Year	r 2020		
Offering Department	Biological			Quota	169		
Course Co-ordinator	Dr Juan G	aitan-Espitia, Biologica	l Sciences (jdgaitan@hku.hk)		'		
Teachers Involved	(Dr E Pick	ett,Faculty of Science)					
		aitan-Espitia,School of E	,				
Course Objectives	attention t knowledge analysis.	This course aims to is to introduce students to the core ideas and concepts of statistical analysis with special attention to the modeling approaches used in biological sciences. The course will give students the skills and knowledge to understand how to apply these concepts using the R statistical programming language for data analysis. Although the course covers some basic concepts (experimental design, distributions, hypothesis testing), the main emphasis of the course is on model building and selection, linear models (regression and analysis of					
			nd mixed effects models, and multiva				
Course Contents & Topics	Introduction Explanation Factorial Regression	Introduction to Statistics and Probability; Descriptive Statistics and Estimation; Statistical Inference; Statistical Explanation and Diagnosis; Likelihood and Model Selection, Categorical predictors (ANCOVA and ANOVA); Factorial design, Multiple Comparisons and Block Design; Correlation and Regression Analyses; Multiple Regression Analysis; Introduction to Multivariate Analyses. Students will learn how to use R to conduct the statistical analyses, and correctly interpret the results.					
Course Learning	On succes	ssful completion of this	course, students should be able to:				
Outcomes	CLO 1	formulate biological q	uestions into statistical questions				
	CLO 2	design experiments e	ffectively				
	CLO 3	appreciate and interp	ret statistics in scientific paper				
	CLO 4	use R to carry out cor	mmon statistical computations				
	CLO 5	understand the assur	nptions of commonly used statistical	methods			
	CLO 6	critically evaluate the					
	CLO 7		cal modeling methods				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BI	OC1600 or BIOL1110 o	or BIOL2306 or ENVS1301 or ENVS	2002 or SCNC1111			
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	2022 : Y	Examination	No Exam		
(A+ to F)	 A Demonstrate thorough grasp of the subject and skills required for attaining all the course learning outcomes. SI analytical and critical abilities and logical thinking, with evidence of original thought. Apply highly effective computa and techniques for basic statistical analyses. Be able to critically use data and statistical results to draw approinsightful conclusions. Apply highly effective organizational and presentational skills. Demonstrate substantial grasp of the subject and skills required for attaining at least most of the course learning Present evidence of analytical and critical abilities and logical thinking. Apply effective computational skills and tec basic statistical analyses. Be able to correctly use data and statistical results to draw appropriate conclusions. Apply organizational and presentational skills. Demonstrate general but incomplete grasp of the subject and skills required for attaining some of the course learning Present evidence of some analytical and critical abilities and logical thinking. Apply moderately effective computational techniques for basic statistical analyses. Demonstrate mostly correct but some erroneous use of data and statistical draw appropriate conclusions. Apply moderately effective organizational and presentational skills. Demonstrate partial and limited grasp of the subject and skills required for attaining some of the course learning Present evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply limite effective computational skills and techniques for basic statistical analyses. Demonstrate limited ability to use data an results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Apply minimally ineffective computational skills and techniques for basic statistical analyses. D						
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Course Teaching & Learning Activities Assessment Methods	C D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme	Present evidence of analytic basic statistical analyses. organizational and present organizational and present evidence of some techniques for basic statist draw appropriate conclusion. Demonstrate partial and lipresent evidence of some effective computational skill results to draw appropriate. Demonstrate evidence of lipresent evidence of lipresent evidence of little of ineffective computational sand/or unable to draw appropriate. Self study	tical and critical abilities and logical thinking. Be able to correctly use data and statistical rational skills. Incomplete grasp of the subject and skills requanalytical and critical abilities and logical thinkical analyses. Demonstrate mostly correct by ns. Apply moderately effective organizational mited grasp of the subject and skills require coherent and logical thinking, but with limite and techniques for basic statistical analyse conclusions. Apply limited or barely effective either or no grasp of the subject and skills require conclusions. Apply limited or barely effective either or no grasp of the subject and skills require lack of analytical and critical abilities, logical kills and techniques for basic statistical analyopriate conclusions. Apply minimally effective Details Details 3 x 10% eachthrough the semester 5% proposal + 5% peer review + 30% final project	Apply effective computational sk esults to draw appropriate conclusing. Apply moderately effective out some erroneous use of data and presentational skills. d for attaining some of the cours d analytical and critical abilities. Is. Demonstrate limited abilities to organizational and presentational united for attaining any of the coursel and coherent thinking. Apply ses. Demonstrate misuse of data or ineffective organizational and presentational integrations of the coursel and coherent thinking. Apply ses. Demonstrate misuse of data or ineffective organizational and presentational and presentational and presentations are sent and coherent thinking. Apply ses. Demonstrate misuse of data or ineffective organizational and presentational and presentations are sent as a sent and presentations.	ills and techniques for usions. Apply effective rese learning outcomes omputational skills and not statistical results to see learning outcomes. Apply limited or barely use data and statistical skills. Apply limited or barely use data and statistical skills. See learning outcomes, minimally effective or a and statistical results oresults or and statistical results or and statistical results or a		
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	C D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Project re Test Zar, J. H. (Dytham, C Good, P.I. Verzani, J	Present evidence of analytic basic statistical analyses. organizational and present organizational and present persent evidence of some techniques for basic statist draw appropriate conclusion. Demonstrate partial and line present evidence of some effective computational skill results to draw appropriate. Demonstrate evidence of little of ineffective computational skill results to draw appropriate of the present evidence of little of ineffective computational skill results to draw appropriate. Or or or or or or or or or or or or or or	tical and critical abilities and logical thinking. Be able to correctly use data and statistical rational skills. Icomplete grasp of the subject and skills requestive analytical and critical abilities and logical thinking analyses. Demonstrate mostly correct bus. Apply moderately effective organizational mited grasp of the subject and skills require coherent and logical thinking, but with limite Is and techniques for basic statistical analyses conclusions. Apply limited or barely effective or lack of analytical and critical abilities, logical thinking the conclusions. Apply limited or barely effective or lack of analytical and critical abilities, logically or lack of analytical and critical abilities, logically or lack of analytical and critical abilities. Details Details 3 x 10% eachthrough the semester 5% proposal + 5% peer review +	Apply effective computational sk esults to draw appropriate conclusing. Apply moderately effective out some erroneous use of data and presentational skills. If or attaining some of the cours density and presentational skills. If or attaining some of the cours density and analytical and critical abilities. It is be proposed to be organizational and presentational aired for attaining any of the coursal and coherent thinking. Apply is because of data or ineffective organizational and presentational and presentational and presentational and coherent thinking. Apply is a proposed of the course of data or ineffective organizational and presentational and	ills and techniques for usions. Apply effective rese learning outcomes omputational skills and statistical results to se learning outcomes. Apply limited or barely use data and statistical skills. See learning outcomes. Apply limited or barely use data and statistical skills. See learning outcomes minimally effective or and statistical results presentational skills. No. of Hours 36 24 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6,7 CLO 1,2,3,4,5,6,7 CLO 1,3,4,5,7		

BIOL2103	Biological sciences laboratory course (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	210
Course Co-ordinator	Dr W Y Lui, Biological Sciences (wylui@hku.hk)		

Teachers Involved	(Dr A Yan,Biological Sciences) (Dr W Y Lui,Biological Sciences)					
		C Chow,Biologica	,			
Course Objectives	The objective is to provide students a comprehensive training in basic laboratory techniques used in modern biological studies. The course will cover a number of techniques used by molecular biologists and microbiologists to conduct scientific research.					
Course Contents & Topics	This cours	se will be divided i	nto three modules and each module w	ill have 3 laboratory sessions	5.	
•		ne: Nucleic acid ar NA isolation, spect	nalysis crometry, gel electrophoresis, restriction	n enzyme analysis and DNA	sequence analysis.	
		vo: Protein analysi ation, chromatogra	s phy and SDS-PAGE electrophoresis.			
	Microscop serial dilu	tion, enumeration	microorganisms and staining of bact of microbial cells by Petroff-Hausser c om natural source and statistical analys	ounting chamber, and turbid		
Course Learning			f this course, students should be able t			
Outcomes		•	edge in proper use of simple research			
	CLO 2 de		edge and understanding of how and		used in a research	
			laboratory techniques for carrying out e			
	aı	nd response to dye	erent ways that microorganisms were one etc. and how they were counted	ategorized according to thei	r size, shape, colour	
Pre-requisites	Pass in B					
and Co-requisites and Impermissible combinations)	Not for stu	udents having take	en any level 3 (or above) Biochemistry	(BIOC) course or BBMS200 ⁻	1.	
Offer in 2020 - 2021	Y 1st	sem 2nd sem	Offer in 2021 - 2022 : Y	Examination	Dec May	
Grade Descriptors (A+ to F)	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.				
	В	Demonstrate substantial command of a broad range of knowledge required for attaining at least most of the course learning outcomes. Evidence of analytical and critical abilities and logical thinking. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.				
	C Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.				
	Fail	Demonstrate little or lack of analy	r no evidence of command of knowledge requi tical and critical abilities, logical and coherent tl of data and results and/or unable to draw appro	ninking. Apply minimally effective o	r ineffective lab skills and	
Course Type	Laborator	y and workshop co	ourse			
Course Teaching	Activities	S	Details			
& Learning Activities	Laborato	ry	11 laboratory sessions (4 hours	s each)	44	
	Tutorials		lecture/tutorials		18	
		/ Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Laborato	ry reports	plus lab performance	60	CLO 1,2,3,4	
	Test		1 hour final examination	40	CLO 1,2	
Course Website	http://mod	dle.hku.hk/	·			
Additional Course Information	Lab A on Quota 10	5 - 2nd Semester	ents and Lab. B on Thurs. with 70 students:	lents		

istry (6 credits)	Academic Year	2020			
	Quota	100			
ences (clivelo@hku.hk)					
ences)					
provide undergraduate (non-biochemistry major) an ands-on experience in biochemical techniques.	overview of funda	amental concepts			
An introduction to various biomolecules in terms of their structures, functions, syntheses and metabolisms, with emphasis on amino acids, proteins, enzymes, carbohydrates, lipids and nucleic acids. The correlations between their biochemical properties and their roles in various life processes will be illustrated.					
On successful completion of this course, students should be able to:					
CLO 1 describe the key structural features of carbohydrates, proteins, lipids and nucleotides					
CLO 2 understand the basic enzyme kinetic properties					
CLO 3 explain how the common sugars, fatty acids and amino acids are metabolized and synthesized in living cells					
Pass in BIOL1110; and Not for students who have passed in BIOC2600, or have already enrolled in this course.					
, es tr	, proteins, enzymes, carbohydrates, lipids and nucle es and their roles in various life processes will be illust of this course, students should be able to: tructural features of carbohydrates, proteins, lipids and sic enzyme kinetic properties	, proteins, enzymes, carbohydrates, lipids and nucleic acids. The corres and their roles in various life processes will be illustrated. of this course, students should be able to: tructural features of carbohydrates, proteins, lipids and nucleotides sic enzyme kinetic properties			

Offer in 2020 - 2021	Y 1st s	sem Offer in 2021 - 20	22 : Y	Examination	Dec	
Grade Descriptors (A+ to F)	Α	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Integration of the full range of appropriate theories, principles, evidence and techniques				
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. General integration of theories, principles, evidence and techniques				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Some partial integration of theories, principles, evidence and techniques				
	D	Show evidence of some coh	ed command of knowledge and skills re erent and logical thinking, but with limite s. Limited integration of theories, principl	d analytical and critical abilities. She		
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Little or no or inapt integration of theories, principles, evidence and techniques				
Course Type	Lecture wit	h laboratory component	course			
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures			24		
	Laboratory	1	3 laboratory sessions	24		
	Tutorials				12	
	Reading / Self study				100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examination	on		50	CLO 1,2,3	
	Laboratory	reports		15	CLO 1,2,3	
	Test			35	CLO 1,2,3	
Required/recommended reading and online materials	L.A. Mora Internation		Scrimgeour, M.D. Perry: Prin	nciples of Biochemistry 5th	n edition (Pearson	
Course Website	http://mood	lle.hku.hk/				

BIOL2306	Ecology	y and evolution (6 credits)	Academic Year	2020			
Offering Department		l Sciences	Quota	80			
Course Co-ordinator	Dr A L As	shton, Biological Sciences (lashton@hku.hk)					
Teachers Involved	(Dr B Gu (Dr C Din (Dr C Sch (Prof G A	shton,Biological Sciences) enard,Biological Sciences) igle,Biological Sciences) nunter,Biological Sciences) Williams (Field course component only),Biological Sciences)					
Course Objectives	explains and non- what we	action between organisms and their environment is addressed using a how the ecology of plants and animals has been shaped by evolution t living environment. The course also demonstrates how we can underst see in nature using scientific methods. A field course component pro- environment influences community composition, biodiversity and adapti	hrough interaction and and explain to vides the opporture	is with their living ne significance o nity to investigate			
Course Contents & Topics	and how and adaps species a ecology evolution interaction structurin with the erecord are environment that threat Lectures	ronment influences organisms profoundly. It affects their present-day expansion can survive there) and, through natural selection acting over passibations. Present day human-induced changes to the environment are and degrading their habitats. This introductory course introduces and evolution, showing how they are linked to the environment ary adaptation which, in turn, lead to specialization and generate in swill be a major focus of the course together with discussion of ag, life histories, and niche dynamics. The principles of ecology and denvironment will also be demonstrated by describing the origins of modern relationship to other primates, and the main ecological transformation in the globally. The course will conclude with an account of the importance complemented by a 5-day field course during the Reading Week work to study their biodiversity, community composition and the relation tent.	at generations, inflet also responsible also responsible ome basic scient by physiological biodiversity. Indiversity population dynate evolution resulting odern humans, in tions caused by hince of biodiversity hen students visit	Jences their form for endangering ific principles of tolerances and iduals and their mics, community from interaction cluding our fossil umans and their y, and the factors a variety of Hong			
Course Learning Outcomes	CLO 1 u e CLO 2 u a CLO 3 u	essful completion of this course, students should be able to: nderstand how scientific methods (hypotheses, experiments, comp cological and evolutionary processes nderstand the basic mechanism of natural selection, and how interact daptation and generate biodiversity nderstand that ecology and behaviour can be interpreted in the ligh	tions with the env	ironment lead to			
	CLO 4 u CLO 5 u	nvironment upon individual organisms nderstand the ecological factors influencing evolution, using the human nderstand the community ecology and biodiversity of selected H daptations of organisms found there					
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in BIOL1110 or BIOL1309 or ENVS1301 or ENVS1401					
Offer in 2020 - 2021	Y 1st	t sem Offer in 2021 - 2022 : Y	Examination	Dec			
Grade Descriptors (A+ to F)	A	Evidence of complete or near-complete understanding and a thorough grasp of the s learning outcomes, and excellent use of named (organism) examples, including lc organizational, presentational and/or analytical skills and fieldwork techniques. Excel what is required at degree level.	ocal species and habi lent or outstanding (fo	tats. Show excellent A+) work relative to			
	В	Evidence of substantial understanding and a good grasp of the subject as demonstration outcomes, and use of named (organism) examples, including local species a presentational and/or analytical skills and fieldwork techniques. Work more than suffice	nd habitats. Show g	ood organizational,			

	С	incomplete attainment of rorganizational, analytical, prodegree level.	tanding with an adequate (but incomplete nost of the learning outcomes, with lim esentational and/or analytical skills and field	ited use of named (organism) dwork techniques. Work sufficier	examples. Show fair at for what is required for	
	D	Evidence of retention of a minimum of relevant information and incomplete understanding of the subject (i.e. knowledge is very incomplete), as demonstrated by partial but limited attainment of learning outcomes. Insufficient familiarity with fieldwork techniques, habitats or organisms. Work merely (for D+) or barely (D) adequate for what is required at degree level.				
	Fail		ate knowledge and understanding of the su ence of familiarity with fieldwork techniques,			
Course Type	Lecture wi	th laboratory componen	t course			
Course Teaching	Activities	•	Details		No. of Hours	
& Learning Activities	Lectures		24 hours lectures, plus 10 hor residential field course	urs of lectures during	34	
	Laboratory		at least 36 hours field and laboratory work, as groups and individuals		36	
	Reading /	g / Self study during the semester in the form of i assigned reading and a laboratory works			80	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents		30	CLO 5	
	Examinat	ion		70	CLO 1,2,3,4	
Required/recommended reading and online materials		Rickleffs & Relya (2018) Ecology: The Economy of Nature (8th edition). New York: W.H. Freeman and Company Molles & Sher (2018) Ecology: Concepts and Applications (8th edition). McGraw-Hill Education				
Course Website	http://moo	dle.hku.hk				
Additional Course Information	Details of made ava	A compulsory 5-day field component during the reading week. Details of the location and cost of the field course, which will be held in the Reading week of semester 1, will be made available at the start of the semester. Priority will be given to students majoring in BS, BS intensive, E&B and E&B intensive.				

BIOL2408	Green	earth-plants and	d mankind (6 credits)	Academic Ye	ear 2020			
Offering Department		al Sciences	•	Quota	30			
Course Co-ordinator	Prof. M L	rof. M L Chye, Biological Sciences <i>(mlchye@hku.hk)</i>						
Teachers Involved	(Dr C Lo	School of Biologica	al Sciences)					
	(Prof M L	(Prof M L Chye,School of Biological Sciences)						
Course Objectives	the esse features	This course is intended for students interested in the fundamentals of plant biology. The course will emphasize or the essential attributes of plants to humans. At the end of the course, students are expected to know the distinct features of plants and appreciate the importance of plants in our daily lives. Specific topics such as genetic engineering and the use of plants for food and medicine, will be addressed.						
Course Contents		he importance of plants to human. How to be a plant? Types of plant biotic interactions. Plant-plant interaction						
& Topics	Plants a	Plants and pathogens. Phytohormones. Plants and environment. Genetic improvements in agriculture. You are what you eat? Medicinal plants.						
Course Learning	On succe	essful completion o	f this course, students should be	e able to:				
Outcomes	CLO 1 F	Realize how plant s	tructure enables functions					
	CLO 2 (Comprehend the es	sentials of plant growth and dev	elopment				
		Inderstand the ab environment	ilities of plants to detect, proce	ess, and interpret information from	n their surrounding			
			actions of plants with the living a	and non-living environment				
	CLO 5	Appreciate the cont	ribution of plants to humans					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	3IOL1110						
Offer in 2020 - 2021	Y 2n	nd sem Offer in 20	021 - 2022 : Y	Examination	May			
Grade Descriptors (A+ to F)	В	learning outcomes. with evidence of or appropriate and insi Demonstrate substa learning outcomes. thinking. Apply effect	ate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course ultcomes. Demonstrate thorough grasp of the subject. Show strong analytical and critical abilities and logical thinking ence of original thought. Apply highly effective lab skills and techniques. Critical use of data and results to draw te and insightful conclusions. Apply highly effective organizational and presentational skills. ate substantial command of a broad range of knowledge and skills required for attaining at least most of the course outcomes. Demonstrate substantial grasp of the subject. Show evidence of analytical and critical abilities and logical Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective					
	С	organizational and presentational skills. Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning						
		outcomes. Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.						
	D							
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcome Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack analytical and critical abilities, logical and coherent thinking. Apply minimally effective or ineffective lab skills and technique Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minima effective or ineffective.							
Course Type	Lecture v	with laboratory com	ponent course					
Course Teaching	Activitie	es	Details		No. of Hours			
Learning Activities	Lectures	S						
	Laborato	ory						
	Field wo	•	Field trip	Field trip				
		/ Self study	·		6 100			
Assessment Methods and Weighting	Method	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mappin			

	Assignments	Lab sessions / reports	30	CLO 1,2,3,4,5		
	Examination		50	CLO 1,2,3,4,5		
	Test		20	CLO 1,2,3,4,5		
Required/recommended reading and online materials						
Course Website	http://moodle.hku.hk					
Additional Course Information	This course will be offered subject	to a minimum enrollment number a	and availability of teachers.			

BIOL2409					cademic Year	2020	
Offering Department	Biological		y and entrepreneurship		uota	40	
Course Co-ordinator	-		ences (bllim@hku.hk)	,		1.4	
Teachers Involved			iological Sciences)				
		m,School of Biolog					
Course Objectives	•		view of the innovative develo	opments in biotech industr	y and provide	the students with	
	useful tool	s in learning how a	an exciting research idea can	be turned into a viable bu	isiness.		
Course Contents & Topics	The purpoindustry. Tentreprene to develop firm. Topic covered as be present Topics: 1. Introduc 2. IP rights 3. Licensin 4. Technol 5. How to 1 6. Agrobio 7. Drug de 8. Diagnos	se of the course is the course will proper the course will proper the course will proper the course will be successful busines on intellectual proper the course will be set on the course of the cour	s to introduce you to the entrevide a thoughtful, practical guplace a special emphasis on eas ideas, however we will also roperties, patent laws, patent it the course, guest entreprend and explain their involvement on, Patent system, USPTO, Sours) se and HKSTP (3 hours) tup companies (3 hours)? reen Tech (Monsanto, Novoz nical trials (Gilead Sciences, II, Diagcor, etc) (4.5 hours)	preneurial process with a iide to the process of success of success the decision to become a so discuss the process of a application process, licenseurs, managers and direct in various biotech and phasology Business (3 hours) IPO, PCT (6 hours)	focus on the bessfully launch biotech entrepmoving from a sing and fundors ors of the biotearmaceutical communication.	ning an preneur and how n idea to a bioteclarising will be each industry will	
Course Learning Outcomes	On success CLO 1 un CLO 2 un CLO 3 na up CLO 4 ga	11. Company analysis On successful completion of this course, students should be able to: CLO 1 understand and demonstrate knowledge of the development and management of biotechnology business CLO 2 understand and demonstrate how discoveries and inventions are commercialized CLO 3 navigate the various steps in the development of a biotechnology derived product: from bench, to scale up,to market CLO 4 gain technical and business knowledge of the biotechnology and bioprocessing industries					
	CLO 5 pa	rticipate and contr	ibute to the business side of	scientific enterprises			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in 11 NOT for st		passed in BIOL3409.				
Offer in 2020 - 2021	Y 2nd	sem Offer in 20	21 - 2022 : Y	Ex	amination	No Exam	
Grade Descriptors	Α		ceptional skills and knowledge from t	he course and are capable of inc	dependently analy	zing the business and	
(A+ to F)			pments of various biotechnology ven				
	В		te a broad and in-depth understar				
	capable of analyzing the business and technological developments of various biotechnology ventures under guidance. C Students demonstrate a broad and in-depth understanding of the current developments in biotechnology industry.						
	D Students demonstrate a broad and in-depth understanding of the current developments in biotechnology industry.						
	Fail Students fail to demonstrate a moderate understanding of the current developments in biotechnology industry.						
Course Type	Lecture-ba	sed course			0,	•	
Course Teaching	Activities		Details			No. of Hours	
& Learning Activities	Lectures						
•	Field work	(
	Group wo		Presentation	Presentation			
		Self study		1 1000 Ration		12 60	
	Assessme	•				18	
Assessment Methods and Weighting	Methods		Details	Weighting course g	rade (%)	Assessment Methods to CLO Mapping	
	Assignments			60	0	CLO 1,2,3,4,5	
	Presentati	ion		20	0	CLO 1,2,3,4,5	
	Test			20	0	CLO 1,2,3,4,5	
Required/recommended reading and online materials	McGraw H	lill annual reports	C. Dorf, Andrew J. Nelson (20	11) Technology Ventures:	From Idea to	Enterprise 3rd ed	
Course Website		dle.hku.hk/					
Jourge Mendile							
Additional Course	This cours	a will be offered a	ubject to a minimum enrollme	int number and availability	of taachare		

BIOL3101	Animal behaviour (6	credits)	Academic Year	2020

Offering Department	Biological	Sciences		Quota	30		
Course Co-ordinator		Sin, Biological Science	ces (sinyw@hku.hk)	,	1 1 1		
Teachers Involved	(Dr S W Y	Sin, School of Biologi	ical Sciences)				
Course Objectives	The purpose of this course is to introduce students with the diversity in animal behaviour and the means of understanding animal behaviour. The course will teach students the underlying mechanism and function of behaviour, and how did a particular behaviour develop and evolve.						
Course Contents & Topics	influence students v behaviora foraging; I sociality ir field, as w	Why do animal behaviours vary among individuals and species? How do environment and ecological interactions influence behaviours? What are the underlying genetic mechanism of a particular behaviour? In this course, students will learn to think within the ecological and evolutionary perspectives on animal behaviour. Topics include behavioral ecology; behavioral genetics; reproductive behaviour; mating system; parental care; communication; foraging; learning; migration and biological rhythms; evolutionary stable strategies; sexual selection; altruism; and sociality in vertebrates and invertebrates. We will discuss several classical studies that form the foundation of this field, as well as more recent research that have led to current understanding of animal behaviour. This course will give students a unique perspective on the natural world and our own species.					
Course Learning Outcomes	On succes CLO 1 lea CLO 2 ur CLO 3 ap CLO 4 lea CLO 5 thi	On successful completion of this course, students should be able to: CLO 1 learn and appreciate the mechanism, function, development, and evolution of animal behaviour CLO 2 understand the complexity of interactions between natural and sexual selection and animal behaviour CLO 3 appreciate current theories that form basis for modern understanding of animal behaviour CLO 4 learn the scientific reasoning and methodology in the field of Animal Behaviour CLO 5 think analytically, based upon ecological and evolutionary principles, to explain the behaviours observed in					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Bl	e natural world and oเ OL2306	ur own specie				
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 -	2022 : Y	Examination	Dec		
Grade Descriptors	Α			parative perspective as demonstrated by			
(A+ to F)	В	excellent use of named examples and case studies. Evidence of independent critical thought with excellent use of a broad range of fundamental concepts to draw insightful and logical conclusions. Show eagerness to learn, great abilities of independent work, effective presentation skills with excellent analytical argumentation. Excellent or outstanding work relative to what is required at degree level. B Evidence of a good grasp of the subject as demonstrated by some background reading and appropriate use of named examples and some case studies. Evidence of good critical thought, although not necessarily original. Good and very good (but not outstanding) abilities of independent work, effective presentation skills with good analytical and logical argumentation. Good					
	С	general command of acquired knowledge to draw meaningful and logical conclusions. Work more than sufficient for what is required at degree level. Demonstrate an adequate, but not coherent and incomplete grasp of the subject, with limited background reading and limited use of named examples and case studies. Some abilities of logical critical thinking, but not insightful and/or independent; only partial abilities to use acquired knowledge and work independently to draw meaningful conclusions. Fair presentation skills, with mostly correct argumentation, but limited (or no) abilities to integrate broader concepts. Work sufficient for what is required for degree level.					
	Demonstrate some grasp of the subject, but partial and limited to the most basic concepts, examples, and limited (or none) case studies. Insufficient evidence of background reading, limited abilities of critical independent thinking, and not particularly effective presentation skills with generally weak logical argumentation and restricted ability of drawing appropriate conclusions. Work barely meets what is required at degree level. Fail No evidence of basic minimum knowledge and understanding of the subject. No evidence of background reading and no familiarity with any relevant examples and case studies. Inadequate evidence of coherent logical thought; ineffective presentation skills with poor argumentation and no abilities to draw meaningful conclusions. Work fails to reach degree level.						
Course Type	Lecture wi	th laboratory compon	•	5			
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures						
	Laboratory Tutorials		Lab work, field trips, or debates/presentations		24 6		
Assessment Methods	_	Self study	Deteile	18/-:	100		
and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments			50	CLO 1,2,3,4,5		
	Examinat			50	CLO 1,2,3,4,5		
Required/recommended reading and	2018.	D. R. Rubenstein & J. Alcock. Animal Behavior: An Evolutionary Approach. Oxford University Press; 11th edition; 2018.					
online materials	IN. B. Davi	I. B. Davies, J. R. Krebs & S. A. West. An Introduction to Behavioural Ecology. Wiley-Blackwell; 4th edition; 2012. http://moodle.hku.hk					
Course Website	http://moo	dle.hku.hk					
	http://moo	dle.hku.hk		umber and availability of teachers			

BIOL3105	Animal physiology and environmental adaptation (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	60
Course Co-ordinator	Prof A O L Wong, Biological Sciences (olwong@hku.hk)		
Teachers Involved	(Dr W Y Lui,Biological Sciences) (Dr Y L Zhai,Biological Sciences) (Prof A O L Wong,Biological Sciences)		
Course Objectives	The course covers the major aspects of animal physiology for environment habitats. Stress will be given to the functional interactions between animals a mechanisms by which animals obtain resources for survival from the enviror via sensory structures, and respond to adversities in the environment by alteri	nd the environment, nment, detect enviro	especially on the nmental changes
Course Contents & Topics	Basic concepts of animal adaptation to environmental changes/extreme emetabolism according to oxygen availability; Different models of gaseous eterrestrial habitats; Cross-adaptation to different environment: air-breathing fit Visual signals & differential levels of photoreception from protozoa to mamma mechanisms for color presentation; Sound wave as environmental signals: in aquatic & terrestrial habitats; Echo sounding in bats for navigation morphological & physiological adaptations in hostile environment: extreme he aquatic habitats & water availability in terrestrial habitats on osmoregula	environment; Modific exchange for aquationsh vs diving adaptatals; Background adafunctions & mecharal without visual signot vs freezing cold; s	cation of energy c, inter-tidal, and ions in mammals; ptation: functions iisms of detection als; Behavioral, alinity changes in

	metabolisr	n.					
Course Learning	On succes	sful completion of this c	ourse, students should be able to:				
Outcomes	CLO 1 ha	ve a broad understandir	ng on functional interactions betwe	en animals and their envir	onment		
	CLO 2 ap	preciate the role of the	environment in shaping the evolution	on of animal structures & f	unctions		
	CLO 3 co	mprehend a wide rang	e of physiological adaptations (be	oth structurally & function	ally) in coping with		
	en	vironmental stress and	environmental changes	·	,		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BI	ass in BIOL2103 or BIOL2220 or BIOC2600 or MEDE2301					
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	022 : Y	Examination	May		
Grade Descriptors (A+ to F)	A	outcomes. Show strong ana knowledge to a wide range consistently demonstrate info	tery at an advanced level of extensive k llytical and critical abilities and logical think of complex, familiar and unfamiliar situat ormed, thoughtful intellectual engagement	king, with evidence of original the ions. Apply highly effective orga with broad range of relevant cond	ought, and ability to apply nizational skills. Writings cepts.		
	В	outcomes. Show evidence of some unfamiliar situations. engagement with broad rangement with some statement of the statement o		al thinking, and ability to apply kings mostly demonstrate informe	nowledge to familiar and ed, thoughtful intellectual		
	С	Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational skills. Writings mostly indicate informed, intellectual engagement with concepts or theories but not always with sufficient depth, breadth or understanding.					
	Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational skills. Writings indicate some intellectual engagement with concepts or theories but mostly at a superficial level.						
	Fail Demonstrate little or no evidence of command of knowledge required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organizational skills are minimally effective or ineffective. Writings reveal an absence of intellectual engagement with concepts or theories. Writings are irrelevant or superficial.						
Course Type	Lecture-ba	ased course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading /	Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examination			70	CLO 1,2,3		
	Test test & continual assessment 30				CLO 1,2,3		
Required/recommended	Christophe	er D. Moyes & Patricia M	1. Schulte (2015), Principles of Ani	mal Physiology, Pearson.			
reading and			& Margaret Anderson (2012), Anim		sociate.		
online materials	E. N. Mari	eb (2012), Essentials of	Human Anatomy & Physiology. Be	enjamin Cummings.			
Course Website		dle.hku.hk/					
Additional Course Information		ne Website of School of l se will be offered subject	Biological Sciences. to a minimum enrollment number	and availability of teachers	S.		

BIOL3107	Plant p	hysiology (6 credits)		Academic Year	2020			
Offering Department	Biologica	l Sciences		Quota	30			
Course Co-ordinator	TBC, Bio	TBC, Biological Sciences ()						
Teachers Involved	(TBC,Bio	(TBC,Biological Sciences)						
Course Objectives		To give an understanding of plant processes such as plant growth and development and their regulatory mechanisms.						
Course Contents & Topics	transduc	Discovery, assay, chemical nature, mechanism, structure-activity relationships, physiological effects, and signal transduction of plant hormones. Hormonal transport. Selected topics on plant growth and development including photo-morphogenesis, seed germination, dormancy, apical dominance, fruit ripening, leaf abscission, and plant defense.						
Course Learning	On succe	essful completion of this c	ourse, students should be able to:					
Outcomes	CLO 1	understand the study of	plant biology using mutants in mode	el plant Arabidopsis				
	CLO 2	understand biotechnolog	ical opportunities by manipulating p	lant gene expression				
	CLO 3 understand the regulation of plant growth and development by various plant hormones							
and Impermissible combinations) Offer in 2020 - 2021	N Of	fer in 2021 - 2022 : N		Examination				
Grade Descriptors	Α	In written examination: Exce	ptionally good organization and presentation		early written and show			
(A+ to F)	Ь	evidence of originality. In practical sessions: excellent insight in to the practical aims; submit good reports. B In written examination: coherent organization and clear presentation, the discussion would be a complete and critical response to						
	B In written examination: coherent organization and clear presentation, the discussion would be a complete and critical response to questions. In practical sessions: full understanding of the practical aims; submit accurate reports.							
	C In written examination and practical sessions: Good in parts, but important points omitted. Might also have defects in presentation or be not very well written. Reasonably competent, but might show misunderstanding of the material: significant inaccuracies or errors.							
	In written examination and practical sessions: Some knowledge of the material is evident, but there are serious deficiencies in understanding, organization, clarity or accuracy. Write-ups that are unduly brief would fall into this category.							
	Fail In written examination and practical sessions: Poor knowledge and understanding of the subject, a lack of coherent and organization, and answers are largely irrelevant.							
Course Type	Lecture v	vith laboratory componen	t course					
Course Teaching	Activitie	s	Details		No. of Hours			
& Learning Activities	Lectures				24			
	Laborato	ory			24			
	Tutorials				6			
	Reading	/ Self study			100			
Assessment Methods	Methods		Details	Weighting in final	Assessment			

and Weighting			course grade (%)	Methods to CLO Mapping		
	Examination		75	CLO 1,2,3		
	Laboratory reports		25	CLO 3		
Required/recommended reading and online materials	P. J. Davis: Plant Hormones: Physiology, Biochemistry and Molecular Biology (Martinus Nijhoff Publishers, 1995, 2nd ed.) P.J. Davis: Plant Hormones: Biosynthesis, Signal Transduction, Action! (Springer Netherlands, 2010) Lecturing materials and journal articles will be posted on HKU Moodle.					
Course Website	http://moodle.hku.hk/					
Additional Course Information	This course will be offered subject to	a minimum enrollment number a	and availability of teachers	3 .		

BIOL3108	Microbi	al physiology (6 cre	edits)	Academic Ye	ar 2020			
Offering Department		l Sciences	·	Quota	50			
Course Co-ordinator	Dr A Yan	, Biological Sciences (a	yan8@hku.hk)		'			
Teachers Involved	(Dr A Yar	Dr A Yan,Biological Sciences)						
Course Objectives	pharmace molecular foundatio Upon cor	Microbes are amazing and important entities on earth. Knowledge of microbes is widely applied in food, sharmaceutics, biotechnologies, diseases control, and biogeochemical processes. Microbial Physiology provides molecular basis for understanding of these important processes and applications, and to serve as essential oundations for sub-disciplines of Microbiology, such as environmental, industrial, and medicinal Microbiology. Upon completion, students will acquire fundamental knowledge and methodologies for microbial studies and be able to relate knowledge to various microbial applications.						
Course Contents & Topics	organized these the including: microbes' metabolis highly int	Serving as a fundamental course for the understanding of the world of microorganisms, Microbial Physiology is organized and presented in three themes: 'Microbial Rules', 'Microbial Breath', and 'Microbial Adaption'. Under nese three themes, a broad range of highly educational and interesting topics are presented including: 'Microorganisms and their position in the living world', 'Fundamental methodologies for the study of nicrobes', 'Microbial structures and functions', 'Microbial growth and control', 'Energy Generation', 'Central netabolism', and 'Regulation and control of metabolic Activities'. Topics are taught in a coherent manner with a lighly interactive tutorial session following each of the topics such that students will achieve a high quality, timulating, and problem-based learning experiences.						
Course Learning		•	course, students should be able	to:				
Outcomes			of microbial metabolisms and the		esponses			
			es underlying the dynamic natur					
	CLO 3 r	relate knowledge to prac	ctical application of microbes in i	ndustry and medicine				
	CLO 4	develop abilities to read	and assess scientific literature in	n microbiology area				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	SIOC2600 or BIOL2103	or BIOC3604					
Offer in 2020 - 2021	N Off	fer in 2021 - 2022 : N		Examination				
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational skills.						
	B Demonstrate substantial command of a broad range of knowledge required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational skills. C Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Show							
		evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational skills. Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. Show						
	Fail	evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to knowledge to solve problems. Apply limited or barely effective organizational skills.						
			inimally effective or ineffective.					
Course Type	1	ased course						
Course Teaching	Activities							
			Details		No. of Hours			
	Lectures		Details		36			
	Lectures Tutorials		Details		36 12			
	Lectures Tutorials Project w	vork	Details		36 12 2			
& Learning Activities	Lectures Tutorials Project w Reading	vork / Self study		Weighting in final	36 12 2 100			
& Learning Activities Assessment Methods and Weighting	Lectures Tutorials Project w	vork / Self study	Details Details	Weighting in final course grade (%)	36 12 2			
& Learning Activities Assessment Methods	Lectures Tutorials Project w Reading	vork / Self study			36 12 2 100 Assessment Methods			
& Learning Activities Assessment Methods	Lectures Tutorials Project w Reading Methods Assignme	vork / Self study s	Details	course grade (%) 20 50	36 12 2 100 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3			
& Learning Activities Assessment Methods and Weighting	Lectures Tutorials Project w Reading Methods Assignme Examina Test	vork / Self study s ents		course grade (%)	36 12 2 100 Assessment Methods to CLO Mapping CLO 1,2,3,4			
& Learning Activities Assessment Methods and Weighting Required/recommended reading and	Lectures Tutorials Project w Reading Methods Assignme Examina Test Primary T Prescott, Woolverte Suppleme On-line to	vork / Self study sents tion Fext Book: Harley, and Klein's Non, published by McGraentary Reading: extbook of Bacteriology	Details mid-term Microbiology, by Joanne M. Ww-Hill y: Kenneth Tobar, U. of Wisco	course grade (%) 20 50 30 Villey, Linda M. Sherwood, a	36 12 2 100 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3 CLO 1,2,3 CLO 1,2,3 CLO 1,2,3			
& Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Lectures Tutorials Project w Reading Methods Assignmetexamina Test Primary T Prescott, Woolverte Supplemetey On-line te (http://www.	ents tion Fext Book: Harley, and Klein's Non, published by McGraentary Reading: extbook of Bacteriology.	Details mid-term Microbiology, by Joanne M. Ww-Hill y: Kenneth Tobar, U. of Wisco	course grade (%) 20 50 30 Villey, Linda M. Sherwood, a	36 12 2 100 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3 CLO 1,2,3 and Christopher J.			
& Learning Activities Assessment Methods and Weighting Required/recommended reading and	Lectures Tutorials Project w Reading Methods Assignme Examina Test Primary T Prescott, Woolverte Suppleme On-line to (http://ww http://moo	ents tion Fext Book: Harley, and Klein's Non, published by McGraentary Reading: extbook of Bacteriology.w.textbookofbacteriologodel.hku.hk/	Details mid-term Microbiology, by Joanne M. Ww-Hill y: Kenneth Tobar, U. of Wisco	course grade (%) 20 50 30 filley, Linda M. Sherwood, a	36 12 2 100 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3 CLO 1,2,3 CLO 1,2,3 Band Christopher J.			

BIOL3109	Environmental microbiology (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	40
Course Co-ordinator	Dr S Crowe, Earth Sciences (sacrowe@hku.hk)		
Teachers Involved	(Dr S Crowe,Biological Sciences)		

Course Objectives	To familiarize students with the role of various microorganisms in natural process which affect our environment, such as cycling of chemical elements, interactions with plants and animals, and the way in which they carry out biodegradation of environmentally important pollutants. Selective groups of microorganism will be examined in						
		•		strated with known examples and o	ases		
Course Contents & Topics	 Advanced aspects of microbial diversity, ecology and growth Contribution of microbial metabolism to biogeochemical processes important in cycling of nutrients Microbial interactions with plants and animals Microbial metabolism of organic compounds, metals and man-made polymers 						
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 a	ppreciate the abundance	and diversity of microorg	anisms in major environmental hab	itats		
	CLO 2 know how microbial metabolic potential translates to ecophysiology and niche occupation CLO 3 connect aspects of microbial abundance, diversity, and metabolic potential to processes in natural are engineered ecosystems						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOL2103						
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021 - 2	022 : Y	Examination	No Exam		
Grade Descriptors (A+ to F)	A	Thorough grasp of the subjection original thought. Apply highly conclusions. Apply highly eff	ect matter. Show very strong and y effective lab skills and technique fective organizational and prese		thinking, with evidence of appropriate and insightful		
	В	Substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Substantial grasp of the subject. Show evidence of analytical and critical abilities and logical thinking. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	General but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. General but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.						
	D	Partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.					
	Fail Little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-b	ased course		,			
Course Teaching	Activitie	S	Details		No. of Hours		
& Learning Activities	Lectures			36			
	Tutorials				16		
	Project w	ork ork			14		
	Reading	/ Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm	ents		80	CLO 1,2,3		
	Test			20	CLO 1,2,3		
Required/recommended reading and online materials	Cumming R.M. Atla Reference Molecular Julian Lev	s, 2009, 12th ed.) s and R. Bartha: Microbia es r Biology of the Cell - Fift wis, Martin Raff, Keith Ro	al Ecology: Fundamentals h Edition by Bruce Alberts bberts, Peter Walter (Dece		,		
Course Website		odle.hku.hk/	icital Micropiology (Mile)	-DIAGNWEII, ZUUB, ZIIU EU.)			
Additional Course Information			to a minimum enrollment	number and availability of teachers	S.		

BIOL3110	Environmental toxicology (6 credits)	Academic Year	2020			
Offering Department	Biological Sciences	Quota	60			
Course Co-ordinator	TBC, Biological Sciences ()					
Teachers Involved	(TBC,Biological Sciences)					
Course Objectives	To introduce students to the basic principles of environmental and ecological toxicology by analysis of the fate of pollutants in lithosphere, hydrosphere, atmosphere and biosphere. Mechanisms of toxicity as dose-response will be analyzed through adsorption, metabolism, toxicity and elimination. Major metabolic processes and enzymest involved will be highlighted. Specific cases of toxicity will be presented and discussed.					
Course Contents & Topics	Environmental chemistry of pollutants and their toxicity and factors governing toxic effects, bioaccumulation and biomagnification Partitioning and transformation of environmental pollutants Quantitative toxicology using dose-response approaches Emerging endocrine-disrupting chemicals and carcinogens at molecular levels Elimination of pollutants from the environments Laboratory testing of toxicity and review various adsorption isotherm models					
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 understand fate and distribution of chemicals in various comp. CLO 2 understand toxicity through adsorption, metabolism, eliminatic CLO 3 understand mechanism of toxicity from specific pollutants of c CLO 4 understand specific biochemical processes and enzymes mineralization CLO 5 understand appropriate techniques in environmental cleaning	on and target site and quantit choice involved in pollutants tran	•			
Pre-requisites	Pass in BIOL2103 or CHEM3141 or ENVS3042					

(and Co-requisites and Impermissible							
combinations)							
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : Y		Examination			
Grade Descriptors (A+ to F)	A	A Thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Thorough grasp of the subject matter. Show very strong analytical and critical abilities and high logical thinking, with evidence of original thought. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.					
	В	Substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Substantial grasp of the subject. Show evidence of analytical and critical abilities and logical thinking. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	С	but incomplete grasp of the effective lab skills and techn	mand of knowledge and skills required for attain e subject. Evidence of some analytical and crit niques. Mostly correct but some erroneous use or granizational and presentational skills.	ical abilities and logical thinki	ng. Apply moderately		
	D	limited grasp, with retention limited analytical and critical	d of knowledge and skills required for attaining of some relevant information, of the subject. Evic I abilities. Partially effective lab skills and technic ply limited or barely effective organizational and	lence of some coherent and lo ques. Limited ability to use da	gical thinking, but with		
	Fail	or no grasp of the knowledg and coherent thinking. Mini	mand of knowledge and skills required for attain e and understanding of the subject. Evidence of mally effective or ineffective lab skills and techn is. Organization and presentational skills are min	little or lack of analytical and iques. Misuse of data and re-	critical abilities, logical		
Course Type	Lecture wi	th laboratory componen	t course				
Course Teaching	Activities		Details	No. of Hours			
& Learning Activities	Lectures				24		
	Laborator	у	laboratory, assignment; and seminar		36		
	Reading /	Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examinat	ion		60	CLO 1,2,3,4,5		
	Laboratory reports		student-based assessment includes laboratory report, assignment, presentations or other forms	40	CLO 1,2,3,4,5		
Required/recommended reading and online materials	W. Stumm	ı, J.J. Morgan: Aquatic C	ology and Chemistry (Oxford, 1998) Chemistry: Chemical Equlibria and Rate nental Microbiology (Wiley-Blackwell, 2		ey, 1995, 3rd ed.)		
Course Website		dle.hku.hk/	, , , , , , , , , , , , , , , , , , ,	. ,			
Additional Course Information			to a minimum enrollment number and	availability of teachers.			

BIOL3201	Food c	hemistry (6 cr	edits)			Academic Year	2020
Offering Department	Biologica	al Sciences				Quota	60
Course Co-ordinator	Dr J C Y	Lee, Biological S	Sciences (jettylee@	Dhku.hk)			
Teachers Involved		(Dr J C Y Lee,School of Biological Sciences) (Dr L Zhang,School of Biological Sciences)					
Course Objectives		To provide a basic understanding of chemistry in food systems, and to provide practical training in chemistry related to food science and nutrition.					
Course Contents & Topics	The course will cover the components of food, including water, proteins, carbohydrates and lipids, and minor components such as enzymes, vitamins, minerals, colorants, flavorants and additives. The physical and chemical properties of these important constituents of foods are covered in detail, and form the basis for understanding the reactions which occur during the production, processing, storage and handling of foods, and in understanding the methods used in analyzing foods. A series of laboratory sessions will cover analysis of food components, protein chemistry, lipid oxidation, properties of sugars and starches, enzymatic and non-enzymatic browning reactions, and sensory analysis of foods.						
Course Learning	On succe	essful completion	of this course, stu	idents should be a	able to:		
Outcomes	CLO 1 u	understand the fu	nctions and prope	rties of major and	minor food compor	nents	
	CLO 2 understand the basic chemistry behind food processing						
	CLO 3 h	CLO 3 have integrated their knowledge of biological and chemical principles into a food science and nutrition context					
Pre-requisites (and Co-requisites and Impermissible combinations)			L2103 or BIOL222 dents admitted in		and NOT for stude ore.	nts who have pas	sed in BIOL2101
Offer in 2020 - 2021	Y 1s	st sem Offer in :	2021 - 2022 : Y			Examination	Dec
Grade Descriptors (A+ to F)	Α		pply this knowledge. C		now extensive knowledon nd techniques and anal		
	В	Demonstrate substantial grasp of the subject matter covered. Show thorough knowledge and understanding of the content and a high level of competence in the topics covered and able to apply this knowledge and skills to most situations. Use lab skills and techniques and analysis of data and results to draw generally appropriate conclusions.					
	С	Demonstrate general but incomplete grasp of the subject matter covered. The student has a sound knowledge and understanding of the main areas of content and has achieved an adequate level of competence in the topics covered. Use lab skills and techniques and analysis of data and results to draw moderately appropriate conclusions.					
	D	knowledge and u	nderstanding of the cor	ntent and has achieved	relevant information of d a limited level of comp priate conclusions occa	etence in the topics o	
	Fail	knowledge and u	inderstanding in few a skills and techniques	reas of the content a	nt information, of the s nd has achieved very and results ineffective	limited competence in	n some of the topics
Course Type	Lecture	with laboratory co	mnonent course				

Course Teaching	Activities Details Lectures		No. of Hours		
& Learning Activities			24		
	Laboratory			24	
	Tutorials			6	
	Reading / Self study			100	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignments	Laboratory	20	CLO 1,2,3	
	Examination		40	CLO 1,2,3	
	Test		40	CLO 1,2,3	
Required/recommended reading and online materials	Fennema OR, Food Chemistry Belitz HD, Grosch W, Schieberk				
Course Website	http://moodle.hku.hk/				
Additional Course Information	his course will be offered subject to a minimum enrollment number and availability of teachers ab. A (Quota: 30): 14:30 pm - 18:50 pm (Monday) ab. B (Quota 30): 13:30 pm - 17:50 pm (Wednesday)				

BIOL3202	Nutrition	nal biochemistry (6 credits)	Academic Year	2020		
Offering Department		Sciences	•	Quota	90		
Course Co-ordinator	DrJCYL	Louie, Biological Scien	nces (jimmyl@hku.hk)	<u>'</u>			
Teachers Involved	(Dr J C Y	Louie, Biological Scien	nces)				
Course Objectives				al metabolism, regulation and hor	neostasis; nutrien		
•	bioavailab	oility and absorption; a	nd functions of micronutrients.	, 3			
Course Contents	Metabolis	m of micronutrients an	nd their biological requirements				
& Topics	Homeosta	atic regulation of micro	nutrients				
	Digestion	and absorption of mic	ronutrients				
			s of vitamins and minerals				
Course Learning			s course, students should be ab				
Outcomes	CLO 1		hemical roles of micronutrients i				
	CLO 2	understand and exp	lain the homeostatic regulation	of micronutrients			
	CLO 3	explain the biochem	ical outcomes of nutrient deficie	ency/excess			
Pre-requisites	Pass in Bl	IOC2600 or BIOL2220	or MEDE2301				
(and Co-requisites							
and Impermissible							
combinations)							
Offer in 2020 - 2021		sem Offer in 2021 -		Examination	Dec		
Grade Descriptors (A+ to F)	A	identification and solving		Show exceptional ability on knowledge y analyze and interpret scientific data a kills			
	В	Demonstrate substantial	grasp of the subject matter covered. S	Show full ability on knowledge integration,			
	and solving. Show reasonable ability to critically analyze and interpret scientific data and draw appropriate conclusions. Demonstrate effective organization / writing skills.						
				r covered. Might show misunderstanding	of the materials. Show		
	Demonstrate general but incomplete grasp of the subject matter covered. Might show misunderstanding of the materials. Show some ability on knowledge integration, problem identification and solving. Show some ability to analyze and interpret scientific						
			nclusions. Demonstrate adequate organ				
	D			ome relevant information, of the subjited ability on knowledge integration, prol			
				t scientific data and draw sometimes e			
		Demonstrate basic organ					
	Fail			formation, of the subject matter covered.			
				 g. Fail to integrate information and identily w conclusions. Demonstrate poor organize 			
Course Type	Lecture-ba	ased course	yzo ana morprot odonimo data ana ara	oondadions. Demonstrate poor organize	ation / Writing Olano.		
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures		Dotailo		36		
9	Tutorials				12		
		/ Self study			100		
Assessment Methods	Methods		Details	Weighting in final	Assessment		
and Weighting	wethous	•	Details	course grade (%)	Methods to CLO Mapping		
	Assignme	ante	in class participation	10	CLO 1,2,3		
	Examinat		iii ciass participation	50	CLO 1,2,3		
	Test	uon	Mid term	40	CLO 1,2,3 CLO 1,2,3		
Required/recommended		S S & Smith I I Adva		abolism. Cengage Learning, 2016			
reading and	Gropper	J.J. & JIIIIII J. L. AUV	anced Number	abolisiii. Geriyaye Learriiliy, 2010	,		
online materials							
online materials Course Website	http://moo	odle.hku.hk/					
			ect to a minimum enrollment nur	mber and availability of teachers			

BIOL3203	Food microbiology (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	120
Course Co-ordinator	Dr H S El-Nezami, Biological Sciences (elnezami@hku.hk)		
Teachers Involved	(Dr H S El-Nezami,Biological Sciences) (Dr T C S Lam,Biological Sciences)		
Course Objectives	This course provides the key concepts and principles of food microbiology with s between microorganisms and food., microbial food spoilage and foodborne disea		
Course Contents	Detection and enumeration of microbes in foods, Factors that influence mic	robes in foods, S	Spores and their

& Topics	significan		food preservation, Chemical pres	servation and natural antimi	crobials, Foodborne
Course Learning			ourse, students should be able to	:	
Outcomes		•	uating microorganisms and their p		
			nding of the causes of food spoil		of a microorganism
		at can spoil a given food		3, 1	3
		evelop and implement ap od	ppropriate measures to control the	e spoilage and pathogenic r	nicroorganisms in a
	CLO 4 de	emonstrate the ability to	work in a team to investigate and	solve problems in food micr	obiology
Pre-requisites	Pass in B	IOC2600 or BIOL2220 or	r MEDE2301		
(and Co-requisites and Impermissible combinations)					
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021 - 2	022 · Y	Examination	No Exam
Grade Descriptors	A		o of the subject matter covered. Show str		
(A+ to F)		evidence of creative ability	and competence in professional-level pro to draw appropriate and insightful conclu	oblem solving. Critically use lab sl	kills and techniques and
	В	thinking with some evidence	asp of the subject matter covered. Sho e of competence in professional-level prof generally appropriate conclusions to r tional skills.	olem solving. Use lab skills and te	chniques and analysis of
	С	and logical thinking with limi data and results to draw m	complete grasp of the subject matter cove ted competence in professional-level prol loderately appropriate but sometimes en ased organizational and presentational sk	olem solving. Use lab skills and te- roneous conclusions to real-world	chniques and analysis of
	D	Demonstrate partial but limi evidence of coherent and I techniques and analysis of	ted grasp, with retention of some releva ogical thinking, but lacking competence data and results to draw sometimes a n-based organizational and presentational	nt information, of the subject matt in professional-level problem sol ppropriate but often erroneous c	ving. Use lab skills and
	Fail	Demonstrate little or no gras and logical thinking, and min data and results ineffective	sp, with retention of little relevant informa nimal competence in professional-level pro ly, leading generally to inappropriate ar team-based organizational and presenta	ition, of the subject matter covered blem solving. Use lab skills and te d usually erroneous conclusions	chniques and analysis of
Course Type	Lecture w	ith laboratory componen	t course		
Course Teaching	Activities	, ,	Details		No. of Hours
& Learning Activities	Lectures				24
J	Laborato	rv			24
	Tutorials	,			12
		/ Self study			100
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignme	ents	Seminars	30	CLO 2,4
		ry reports		20	CLO 1,3
	Test	, ,		50	CLO 2.4
			tion 2005 Thomas I Montrille	e and Karl Matthews, Am	,
Required/recommended	Food Mic	crobiology. An Introduct	ion zuus inomas i moniviile		
reading and	Microbiolo Food Micro	ogy (ASM) Press, Washir obiology: Fundamentals		lichael P. Doyle, Larry R. Be	•
reading and online materials	Microbiolo Food Micro J. Montvil	ogy (ASM) Press, Washir obiology: Fundamentals	ngton, DC and Frontiers, 2007, Edited by M	lichael P. Doyle, Larry R. Be	•
Required/recommended reading and online materials Course Website Additional Course	Microbiolo Food Micro J. Montvil http://moo	ogy (ASM) Press, Washir robiology: Fundamentals le, 3rd edition, American	ngton, DC and Frontiers, 2007, Edited by M	lichael P. Doyle, Larry R. Be	•

BIOL3204	Nutrition	n and tl	he life cyc	le (6 cre	edits)			Academic Year	2020
Offering Department	Biological	I Science	s	•	-			Quota	70
Course Co-ordinator	Dr J C Y L	Lee, Biol	ogical Scien	ces (jetty	lee @hku.hk				
Teachers Involved			ogical Scien gical Science						
Course Objectives		macro-	and micro-					e aims to cover the ns during specific	
Course Contents & Topics	issues: ne influence r	eeds of nutrient	macro- and	micronu s at diffe	trients, as v rent stages	ell as the of the	physiological	th and will be orgar and psychological of Socio-economic fact	determinants tha
Course Learning	On succes	ssful con	npletion of th	nis course	, students s	nould be al	ble to:		
Outcomes	CLO 1 b	be able to	critically as	sess and	identify the	specific ne	eds at differen	t stages of the life cy	cle
	CLO 2 re	relate the	concept of	requireme	ent to physic	logical nee	eds		
	CLO 3 u	understaı	nd the impa	ct of socio	-cultural fac	tors on nut	ritional status		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Blo	IOL2220	or BIOC260	00 or BIC	L3202				
Offer in 2020 - 2021	Y 2nd	d sem (Offer in 2021	1 - 2022 :	Υ			Examination	No Exam
Grade Descriptors (A+ to F)	Α	identifica	ation and solvi	ng. Show	outstanding ab	lity to critica		al ability on knowledge nterpret scientific data a on skills.	
	В	and solv		asonable al	oility to critical	y analyze a	nd interpret scient	n knowledge integration, iific data and draw appi	
	С	Demons some ab	trate general b	ut incomple dge integra	te grasp of the tion, problem i	subject matte lentification a	er covered. Might s and solving. Show	show misunderstanding o some ability to analyze a	and interpret scientifi

	D Fail	Misunderstanding of solving. Use elemen Demonstrate team-bar Demonstrate little or and logical thinking, deficient in ability to a	but limited grasp, with retention of some of the materials is not uncommon. Show limited ab- tary approaches to analyze and interpret scien sed organization and presentation skills of limited no grasp, with retention of little relevant informati and minimal competence in problem solving. Fail analyze and interpret scientific data and draw con-	illity on knowledge integration, tific data and draw sometime effectiveness. on, of the subject matter cover to integrate information and ic	problem identification and serroneous conclusions. ed. Show lack of coherent lentify problems. Seriously
Course Type	Lecture-ba	skills.			
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures				36
	Tutorials		student-centered learning		12
	Reading /	Self study			100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignme	nts	Research-Based Assignment (Individual)	20	CLO 1,2,3
	Presentati	on	Oral presentation	30	CLO 1,2,3
	Project rep	oorts	Group project	20	CLO 1,2
	Test			30	CLO 1,2,3
Required/recommended reading and online materials	Gropper S	.S., Smith J.L & (the Life Cycle. Thomson, 2011 Groff J.L. Advanced Nutrition and Humar th, Belski, Thodis, Shepherd and Tierne		
Course Website	http://mood		·		
Additional Course Information	This course	e will be offered su	bject to a minimum enrollment number	and availability of teache	rs.

	Human	physiology (6 cre	dits)	Academic Yea	ar 2020			
Offering Department		Sciences		Quota	135			
Course Co-ordinator	Dr W Y Lu	ui, Biological Science	s (wylui@hku.hk)					
Teachers Involved	(Dr W Y L	han,Biological Science ui,Biological Science L Wong,Biologicl Sci	s) [′]					
Course Objectives	The cours	se covers major asp g this course, stude	pects of the physiology of the hints will have acquired fundamel	ntal principles of how the bod				
Course Contents & Topics	Overview physiology system; T	of the physiological y; The digestive sys	systems and homeostasis; Neuro tem; Cardiac physiology, the blo The skeletal & muscular system;	al and hormonal communication ood vessels and blood pressur	re; The respirator			
Course Learning			is course, students should be able	e to:				
Outcomes	CLO 1 cc		nce of how the body meets ch		aining a relativel			
	CLO 2 ur	nderstand the function	ns of various body systems					
	CLO 3 ex	kplain normal body fu	nctions through integration of bas	ic physiologic concepts				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	IOC2600 or BIOL210	3 or BIOL2220 or MEDE2301					
Offer in 2020 - 2021	Y 1st	sem Offer in 2021	- 2022 : Y	Examination	Dec			
Grade Descriptors (A+ to F)	В	outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational skills.						
	some unfamiliar situations. Apply effective organizational skills. C Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations.							
		evidence of some analy	tical and critical abilities and logical think					
	D	evidence of some analy Apply moderately effecti Demonstrate partial but evidence of some cohe	rtical and critical abilities and logical think ive organizational skills. t limited command of knowledge required erent and logical thinking, but with limited	ing, and ability to apply knowledge to r d for attaining some of the course lead d analytical and critical abilities. Show	most familiar situation arning outcomes. Sho			
	D Fail	evidence of some analy Apply moderately effecti Demonstrate partial bul evidence of some cohe knowledge to solve prob Demonstrate little or na analytical and critical ab	rtical and critical abilities and logical think ive organizational skills. t limited command of knowledge require	ing, and ability to apply knowledge to r d for attaining some of the course lea d analytical and critical abilities. Show anizational skills. equired for attaining the course learni	most familiar situation arning outcomes. Sho limited ability to app ing outcomes. Lack			
Course Type	Fail	evidence of some analy Apply moderately effecti Demonstrate partial bul evidence of some cohe knowledge to solve prob Demonstrate little or na analytical and critical ab	rtical and critical abilities and logical think ive organizational skills. I limited command of knowledge require erent and logical thinking, but with limited olems. Apply limited or barely effective org: o evidence of command of knowledge r bilities, logical and coherent thinking. Show	ing, and ability to apply knowledge to r d for attaining some of the course lea d analytical and critical abilities. Show anizational skills. equired for attaining the course learni	most familiar situation arning outcomes. Sho limited ability to app ing outcomes. Lack			
	Fail	evidence of some analy Apply moderately effecti Demonstrate partial but evidence of some cohe knowledge to solve prob Demonstrate little or nanalytical and critical at Organizational skills are ased course	rtical and critical abilities and logical think ive organizational skills. I limited command of knowledge require erent and logical thinking, but with limited olems. Apply limited or barely effective org: o evidence of command of knowledge r bilities, logical and coherent thinking. Show	ing, and ability to apply knowledge to r d for attaining some of the course lea d analytical and critical abilities. Show anizational skills. equired for attaining the course learni	most familiar situation arning outcomes. Sho limited ability to app ing outcomes. Lack			
Course Teaching	Fail Lecture-b	evidence of some analy Apply moderately effecti Demonstrate partial but evidence of some cohe knowledge to solve prob Demonstrate little or nanalytical and critical at Organizational skills are ased course	rtical and critical abilities and logical think ive organizational skills. I limited command of knowledge require erent and logical thinking, but with limited olems. Apply limited or barely effective org- o evidence of command of knowledge r olitics, logical and coherent thinking. Show minimally effective or ineffective.	ing, and ability to apply knowledge to r d for attaining some of the course lea d analytical and critical abilities. Show anizational skills. equired for attaining the course learni	most familiar situation arning outcomes. Sho limited ability to app ing outcomes. Lack o adge to solve problem			
Course Teaching	Fail Lecture-bactivities	evidence of some analy Apply moderately effecti Demonstrate partial but evidence of some cohe knowledge to solve prob Demonstrate little or nanalytical and critical at Organizational skills are ased course	rtical and critical abilities and logical think ive organizational skills. I limited command of knowledge require erent and logical thinking, but with limited olems. Apply limited or barely effective org- o evidence of command of knowledge r olitics, logical and coherent thinking. Show minimally effective or ineffective.	ing, and ability to apply knowledge to r d for attaining some of the course lea d analytical and critical abilities. Show anizational skills. equired for attaining the course learni	most familiar situation arning outcomes. Sho limited ability to app ing outcomes. Lack or adge to solve problem No. of Hours			
Course Teaching	Fail Lecture-ba Activities Lectures Tutorials	evidence of some analy Apply moderately effecti Demonstrate partial but evidence of some cohe knowledge to solve prob Demonstrate little or nanalytical and critical at Organizational skills are ased course	rtical and critical abilities and logical think ive organizational skills. I limited command of knowledge require erent and logical thinking, but with limited olems. Apply limited or barely effective org- o evidence of command of knowledge r olitics, logical and coherent thinking. Show minimally effective or ineffective.	ing, and ability to apply knowledge to r d for attaining some of the course lea d analytical and critical abilities. Show anizational skills. equired for attaining the course learni	most familiar situation arning outcomes. Sho limited ability to app ing outcomes. Lack a adge to solve problem No. of Hours 36			
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials	evidence of some analy Apply moderately effecti Demonstrate partial but evidence of some cohe knowledge to solve prot Demonstrate little or in analytical and critical at Organizational skills are assed course	rtical and critical abilities and logical think ive organizational skills. I limited command of knowledge require erent and logical thinking, but with limited olems. Apply limited or barely effective org- o evidence of command of knowledge r olitics, logical and coherent thinking. Show minimally effective or ineffective.	ing, and ability to apply knowledge to r d for attaining some of the course lea d analytical and critical abilities. Show anizational skills. equired for attaining the course learni	most familiar situation arning outcomes. Sho limited ability to app ing outcomes. Lack of edge to solve problem No. of Hours 36 12 100 Assessment Methods			
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials Reading	evidence of some analy Apply moderately effection Demonstrate partial but evidence of some cohe knowledge to solve prob Demonstrate little or no analytical and critical at Organizational skills are assed course s	rtical and critical abilities and logical think ive organizational skills. I limited command of knowledge required rent and logical thinking, but with limited olems. Apply limited or barely effective orgous evidence of command of knowledge required in thinking. Show minimally effective or ineffective. Details	ing, and ability to apply knowledge to red for attaining some of the course lead analytical and critical abilities. Show anizational skills. equired for attaining the course learning wery little or no ability to apply knowled.	most familiar situation arning outcomes. Sho limited ability to app ing outcomes. Lack edge to solve problem No. of Hours 36 12 100 Assessment Methods			
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials Reading	evidence of some analy Apply moderately effection Demonstrate partial but evidence of some cohe knowledge to solve prob Demonstrate little or no analytical and critical at Organizational skills are assed course s	rtical and critical abilities and logical think ive organizational skills. I limited command of knowledge required rent and logical thinking, but with limited olems. Apply limited or barely effective orgous evidence of command of knowledge required in thinking. Show minimally effective or ineffective. Details	ing, and ability to apply knowledge to red for attaining some of the course lead analytical and critical abilities. Show anizational skills. equired for attaining the course learning very little or no ability to apply knowled to apply knowledge. Weighting in final course grade (%)	most familiar situation arning outcomes. Sho limited ability to app ing outcomes. Lack of dedge to solve problem No. of Hours 36 12 100 Assessment Methods to CLO Mappin			
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Fail Lecture-ba Activities Lectures Tutorials Reading Methods Examinat Test Silverthort Sherwood Johnson N Siegel G.	evidence of some analy Apply moderately effecti Demonstrate partial but evidence of some cohe knowledge to solve prot Demonstrate little or nanalytical and critical at Organizational skills are assed course S / Self study tion D. U.: Human Physiolog M. D.: Human Biology J. et al.: Basic Neuro	trical and critical abilities and logical think ive organizational skills. I limited command of knowledge requires erent and logical thinking, but with limited olems. Apply limited or barely effective of evidence of command of knowledge reliables. In a constant of knowledge requires evidence of command of knowledge reliables. In a constant of knowledge reliables. Details Details Details Details iology: An integrated Approach (Pgy: From Cells to Systems (Thoms of Pearson, 2006) ochemistry (Academic Press, 2006) ochemistry (Academic Press, 2006)	weighting in final course grade (%) Weighting in final course grade (%) Weearson, 2008) Son, 2007)	most familiar situation urning outcomes. Shot limited ability to appliing outcomes. Lack of adde to solve problem No. of Hours 36 12 100 Assessment Methods to CLO Mappin CLO 1,2,3			
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials Course Website	Fail Lecture-ba Activities Lectures Tutorials Reading Methods Examinat Test Silverthorn Sherwood Johnson N Siegel G. Mulroney	evidence of some analy Apply moderately effecti Demonstrate partial but evidence of some cohe knowledge to solve prot Demonstrate little or nanalytical and critical at Organizational skills are assed course S / Self study tion D. U.: Human Physiolog M. D.: Human Biology J. et al.: Basic Neuro	rtical and critical abilities and logical think two organizational skills. It limited command of knowledge requires erent and logical thinking, but with limited elems. Apply limited or barely effective orgatories of control of knowledge reduced of command of knowledge reduced or command of knowledge reduced in thinking. Show minimally effective or ineffective. Details Details	weighting in final course grade (%) Weighting in final course grade (%) Weearson, 2008) Son, 2007)	most familiar situation arning outcomes. Sho limited ability to app ing outcomes. Lack of adde to solve problem No. of Hours 36 12 100 Assessment Methods to CLO Mappin CLO 1,2,3			

Information

BIOL3206	Clinical	nutrition (6 credits)		Academic Yea	r 2020
Offering Department		Sciences		Quota	70
Course Co-ordinator	Dr J M F \	Wan, Biological Science	s (jmfwan@hku.hk)		
Teachers Involved	(Dr J M F	Wan, Biological Science	es)		
Course Objectives	This cour specificall		derstanding and insight into	o diseases associated with diet a	nd basic dietetics,
	 Describes Describes Describes Difference 	nd anorexia, cardiovascu ntiate risk factors that inf	e development and preven ular disease, cancer, immun fluence dietary choice.	ation of common chronic diseases e deficiency and renal failure.	such as diabetes
Course Contents & Topics	The basic prevention	es of nutrition for health and of chronic diseases	such as cancer, diabetes,	rition therapy. The role of diet in the obesity and anorexia as well as	bulimia nervosa
	food aller	gy and food intolerance.	Nutrition in pregnancy and		iuminon merapy io
Course Learning			course, students should be a		
Outcomes			onships between diet and di		
	ca	ardiovascular disease, ca	ancer, immune deficiency, a		ty and anorexia,
			terpret risk factors that influence		
Due nem.:!-!4				upport for hospitalized patients	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	IOL3202 or BIOL3203 o	r BIOL3204 or BIOL3205		
Offer in 2020 - 2021	N Off	er in 2021 - 2022 : N		Examination	
Grade Descriptors	Α		stery at an advanced level of exte	ensive knowledge and skills required for a	ttaining all the course
	B C D	effective organizational and data and results to draw app Demonstrate substantial collearning outcomes. Substantial collearning outcomes. Substantial collearning outcomes. Substantial collearning outcomes. Substantial collearning outcomes. General but in outcomes. General but in outcomes. General but inchinking, and ability to apply skills. Apply moderately efferesults to draw appropriate. Demonstrate partial but limited grasp of and logical thinking, but with Apply limited or barely eff techniques. Limited ability organizational and presenta Demonstrate little or no evicor no grasp of the knowled thinking. Show very little or effective or ineffective. App	I presentational skills. Apply highly propriate and insightful conclusions immand of a broad range of know ntial grasp of the subject. Show et to familiar and some unfamiliar sifieldwork skills and techniques. Co presentational skills. Incomplete command of knowledgomplete grasp of the subject. Shy knowledge to most familiar situatective laboratory / fieldwork skills a conclusions. Apply moderately effeited command of knowledge and sthe subject, retention of some relet himited analytical and critical abfective organizational and present to use data and results to drational skills. dence of command of knowledge adge and understanding of the subject and understanding of the subject possibility to apply knowledge to so by minimally effective or ineffective or ine	range of complex, familiar and unfamiliar size effective laboratory/fieldwork skills and tects. Apply highly effective organizational and predege and skills required for attaining at levidence of analytical and critical abilities are situations. Apply effective organizational and precedure of an effective organizational and precedure of some analytical and critical some error of the control of	hniques. Critical use of resentational skills. ast most of the course and logical thinking, and d presentational skills, iate conclusions. Apply of the course learning al abilities and logical and and presentational oneous use of data and second second of the course learning outcomes. It fieldwork skills and d or barely effective tearning outcomes. Littles, logical and coherent onal skills are minimally ses. Misuse of data and cost.
Course Type	Lecture-b	ased course	w appropriate constants. Organiz	zation and procentational offine are minimally	CHOOLIVE OF MICHOCAVE
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures				36
-	Tutorials				12
		/ Self study			100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignme	ents		20	CLO 1,2
	Examinat			60	CLO 1,2,3,4
	Presenta	tion		20	CLO 1,2,3,4
Required/recommended reading and online materials	S. Rodwe Health Pro	ell Williams: Nutrition and omotion Wardlaw Gordo	ailable on the class website. d Diet Therapy (7th ed.) Suon: Perspectives in Nutrition	uitor & Hunter: Nutrition: Principles	and Application ir
Course Website		odle.hku.hk/			
Additional Course	This cours	se will be offered subject	t to a minimum enrollment n	umber and availability of teachers.	
Information				-	

BIOL3207	Principles of toxicology (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	80
Course Co-ordinator	Dr H S El-Nezami, Biological Sciences (elnezami@hku.hk)		
Teachers Involved	(Dr H S El-Nezami, Biological Sciences)		
Course Objectives	To introduce students to methods used in assessing the toxicity of food co- confidence in the handling and interpretation of toxicological data. Students we concepts behind toxicological evaluation, and the criteria for setting guidance exposure to chemicals. Students will understand the role of biochemical, met toxicological evaluation. This course aims to equip students with basic skills studies.	rill also be introdu values for dietar abolic and toxico	iced to the basic y and nondietary kinetic studies in

Course Contents & Topics			exposure and entry routes, fates ology, the dose response relations		
	effects, th	,,	carcinogens. A survey of the health	n effects of common class	es of toxic substances
Course Learning			course, students should be able to):	
Outcomes	CLO 1 de	emonstrate an underst	anding of the processes involved cluding an understanding of the tox	d in absorption, distribut	,
			nding of the various effects induce		
			anding of the factors which underl		
		xicants			
		emonstrate the ability to uman health	o work in a team to investigate and	d solve toxicological prob	ems of importance ir
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	IOC2600 or BIOL2220	or BIOL3205 or MEDE2301		
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021 -	2022 · Y	Examinatio	n No Exam
Grade Descriptors (A+ to F)	A	Demonstrate thorough gra evidence of creative ability analysis of data and result team-based organizational	sp of the subject matter covered. Show stry and competence in professional-level professional to the story appropriate and insightful conclusional presentational skills.	ong analytical and critical abilitie oblem solving. Critically use lab usions to real-world problems. D	es and logical thinking, with skills and techniques and emonstrate highly effective
	В	thinking with some evidend	grasp of the subject matter covered. Sho be of competence in professional-level profits or generally appropriate conclusions to a ational skills.	olem solving. Use lab skills and	techniques and analysis o
	С	and logical thinking with lir data and results to draw	ncomplete grasp of the subject matter cove nited competence in professional-level prol moderately appropriate but sometimes err based organizational and presentational sk	blem solving. Use lab skills and roneous conclusions to real-wo	techniques and analysis of
	D	Demonstrate partial but lir evidence of coherent and techniques and analysis	nited grasp, with retention of some releva logical thinking, but lacking competence of data and results to draw sometimes a am-based organizational and presentational	nt information, of the subject m in professional-level problem s ppropriate but often erroneous	solving. Use lab skills and
	Fail	Demonstrate little or no gr and logical thinking, and m data and results ineffective	asp, with retention of little relevant informa inimal competence in professional-level pro rely, leading generally to inappropriate ar ss team-based organizational and presenta	ation, of the subject matter cove oblem solving. Use lab skills and and usually erroneous conclusion	techniques and analysis of
Course Type	Lecture w	rith laboratory compone	nt course		
Course Teaching	Activitie	s	Details		No. of Hours
& Learning Activities	Lectures				24
	Laborato	ry			24
	Tutorials				12
	Reading	/ Self study			100
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignme	ents	seminars (30%) & opinion paper (30%)	60	CLO 2,4
		ry reports		20	CLO 2
	Test		Mid-term	20	CLO 2,4
Required/recommended reading and online materials	S. S. Des	hpande: Handbook of F	ood Toxicology (Marcel Dekker Ind	c., NY, 2002)	
Course Website	httn://moc	odle.hku.hk/			
Additional Course			ct to a minimum enrollment number	r and availability of teache	re
nformation	Triis cour	se wiii be ollered subjet	cto a millimum emoliment number	and availability of teache	13.

BIOL3208	Food safety and quality management (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	45
Course Co-ordinator	Dr O Habimana, Biological Sciences (ohabim@hku.hk)		
Teachers Involved			
Course Objectives	To provide exposure to some key management concepts used to product succeed in the marketplace. To introduce students to analysis and problem in food safety management.		
Course Contents & Topics	- The regulatory, social and business imperative for food safety Basic concepts in TQM - Statistical Process Control - Quality Function Deployment - Quality management standards (ISO 9000) - Development and implementation of a Hazard Analysis Critical Control food safety management system/ supply chain approach) - Role of environmental management systems (ISO 14000) in the food inclined intellectual Property issues in the food industry - Religious, ethical, and cultural food choices - Illustrative business case studies on food safety management will be dis	dustry	nin an ISO 22000
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 understand the historical development of government regulation of CLO 2 be familiar with a set of management techniques applicable in the CLO 3 be able to analyze food production problems and make recomme safety	food industry	prove quality and
Pre-requisites (and Co-requisites and Impermissible	Pass in BIOL3201 or BIOL3203		

Offer in 2020 - 2021	N Of	fer in 2021 - 2022 : N		Examination	
Grade Descriptors (A+ to F)	A	evidence of creative ability techniques and analysis of	sp of the subject matter covered. Show y and competence in professional-level f data and results to draw appropriate a d organizational and presentational skill:	problem solving. Critically use quality nd insightful conclusions to real-world	management skills and
	В	thinking with some evidend	grasp of the subject matter covered. See of competence in professional-level presults to draw generally appropriate coresentational skills.	roblem solving. Use quality manageme	ent skills and techniques
	С	and logical thinking with lin	ncomplete grasp of the subject matter of nited competence in professional-level presults to draw moderately appropriate effective team-based organizational and	roblem solving. Use quality management but sometimes erroneous conclusions	ent skills and techniques
	D	evidence of coherent ar management skills and to	mited grasp, with retention of some relied logical thinking, but lacking compechniques and analysis of data and light organizations. Demonstrate team-based organizations are seen to the compectation of the	etence in professional-level problen results to draw sometimes appropria	n solving. Use quality te but often erroneous
	Fail	and logical thinking, and techniques and analysis of	asp, with retention of little relevant info minimal competence in professional- f data and results ineffectively, leading on constrate ineffectiveness team-based org	level problem solving. Use quality renerally to inappropriate and usually e	management skills and
Course Type	Lecture-b	pased course			
Course Teaching	Activitie	s	Details	No. of Hours	
& Learning Activities	Lectures			36	
	Tutorials		including presentation		12
	Group w	ork			30
	Reading	/ Self study			100
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignm	ents		10	CLO 2
	Examina	ition		60	CLO 1,2,3
	Project r	eports	including presentation	30	CLO 2,3
Required/recommended reading and online materials	Mortimor		n Press, 1992) IACCP: A Practical Approach (C r of Safe Food (2nd Ed., Wiley-E		
Course Website		odle.hku.hk/	(= =, 11)	., == ,	
Additional Course	1 11		ct to a minimum enrollment num	har and availability of taachara	

BIOL3209	Food an	nd nutri	nt analys	is (6 cre	edits)				Academic Year	r 20)20
Offering Department	Biological	al Science	3						Quota	80)
Course Co-ordinator	Dr J C Y L	Lee, Biolo	gical Scienc	es (jettyle	ee @hku.hi	k)					
Teachers Involved			gical Scienc ogical Scien								
Course Objectives	understan	nd the pri		nd analyti	ical instrun	ments use	d in food ar		ent analysis. To To train students		
Course Contents & Topics	technique: adulterant	es for ma nts in food d: rheolo	cronutrients will be cove	(e.g. pro red. A va	otein, carbo ariety of cla	ohydrate a assical and	and fats), n d instrumen	nicronutri Ital techni	be introduced. ents (vitamins a ques used in fo ectroscopy, chro	and od a	minerals) and analysis will be
Course Learning	On succes	essful con	pletion of th	s course,	, students :	should be	able to:				
Outcomes	CLO 1 ur	ınderstand	the basic p	rinciples c	of food and	d nutrient a	analysis				
			with a variet								
	CLO 3 ur	understand	the principle	es behind	d analytical	l instrumer	nts associat	ted with fo	ood		
			oply their krent and micr			,	lls in novel	l situation	ns to measure	and	analyze the
	CLO 5 be	ne able to	elect and in	stify an a	nnronriate	analytical	technique t	to solve p	ractical food an	alysi	is problems
					рргорпаю	analy tious	•	•			•
(and Co-requisites and Impermissible combinations)	Pass in BI Not for stu	BIOL2101 tudents wl	or BIOL3201 no have pass	l sed in CH	IEM3242	analy acai	·				
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	Pass in BI Not for stu	BIOL2101 tudents wl	or BIOL320	l sed in CH	IEM3242	unuiy usu			Examination	De	
(and Co-requisites and Impermissible combinations)	Pass in BI Not for stu	BIOL2101 tudents what seem O Demonst evidence analysis	or BIOL320 no have pass	sed in CH 2022 : Y rasp of the lity and con ults to draw	Subject matter matter in appropriate	ter covered. \$ professionaler and insightfi	Show strong a -level problem	inalytical an		nd log	ec ical thinking, with d techniques and
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in BI Not for stu	st sem O Demonst evidence analysis team-bas Demonst thinking data and	or BIOL320 on have pass of have pass of creative about data and reseator are substantia with some evide	sed in CH 2022 : Y rasp of the lity and con ults to draw ual and pres 1 grasp of t ence of com aw general	subject matt mpetence in v appropriate sentational sk the subject in petence in p	ler covered. S professional- and insightfi ills. matter cover professional-li	Show strong a -level problem ul conclusions red. Show evi evel problem s	inalytical an isolving. C is to real-woi idence of a solving. Use	Examination d critical abilities an ritically use lab skill	nd log ls and nstrat al abi nique	ec iical thinking, with d techniques and te highly effective lities and logical is and analysis of
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in BI Not for stu Y 1st	st sem O Demonst evidence analysis team-bas Demonst thinking data and organiza Demonst and logic data and logic	or BIOL320- to have pass ffer in 2021- trate thorough g of creative ab of data and res ed organizatior ratio through g of and and res ed organizatior ratio and press in the some evide results to di onal and press rate general bu al thinking with	- 2022 : Y rasp of the lity and con ults to draw all and pres grasp of the conduction of communicational sk tincomplete limited communicational sk was moderate.	subject matter matter matter in vappropriate sentational sk the subject in petence in pally appropriations of the most matter in petence in pally appropriations.	ter covered. S professional- and insightfi ills. matter cover professional-li ate conclusion e subject ma professional-li te but somet	Show strong a -level problem ul conclusions red. Show evi evel problem sons to real-w litter covered. Se level problem sitimes erroneoi	inalytical an isolving. C is to real-wor idence of a solving. Use vorld proble Show some solving. Use	Examination d critical abilities an ritically use lab skill d problems. Demo nalytical and critica e lab skills and tech	nd log ls and nstrat al abi nique effect cal ar nique	ec iical thinking, with d techniques and te highly effective lilities and logical is and analysis of tive team-based and critical abilities is and analysis of
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in BI Not for stu Y 1st A	st sem O Demonst evidence analysis team-bas Demonst thinking data and moderate Demonst and logic data and moderate betwidence techniqui	or BIOL320 to have pass of have pass of have pass of creative about a contract of the pass of data and results to discount of the pass of	2022: Y rasp of the lity and con ults to draw ala and press grasp of tence of com awa general intational sk ti incomplete limited com w moderate m-based org limited gras nd logical ti s of data ai	subject mater mpetence in vappropriate sentational sk the subject in petence	professional- and insightfi (ills. matter cover professional-li ate conclusion e subject ma professional-li te but somet and presenta ntion of som lacking com o draw some	Show strong a level problem ut conclusions red. Show evi evel problem sons to real-whiter covered. Stevel problem sitmes erroneoutional skills. The relevant informational skills appreperation of the strong	inalytical an i solving. C i to real-wor idence of a solving. Use solving. Use solving. Use us conclusi primation, ol offessional-l	Examination d critical abilities an ritically use lab skill d problems. Demo nalytical and critica e lab skills and tech ms. Demonstrate evidence of analytie lab skills and tech ons to real-world pi f the subject matter evel problem solvir ften erroneous con	nd log ls and nstrat al abi nique effect cal ar nique robler cove	ec ical thinking, with d techniques and te highly effective lities and logical is and analysis of tive team-based and critical abilities is and analysis of ms. Demonstrate
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in BI Not for stu Y 1st A B	st sem O Demonst evidence analysis team-bas Demonst thinking data and organiza Demonst and logic data and evidence techniquiproblems Demonst and logic data and data and data and data and data and data and data and data and	or BIOL320 to have pass of have pass of have pass of creative about a control of the pass of creative about a control of the pass of the p	2022: Y rasp of the lity and con ults to draw all and pres grasp of the rence of com aw general intational sk ti incomplete limited com w moderate n-based org limited gras of data aideam-based grasp, with minimal contively, leadil	subject matter meteric in vappropriate sentational sk the subject in petence in pally appropriations. The petence in pely appropriations is sp, with reterbinking, but and results to organization retention of impetence in peling generally	ter covered. S professional- and insightfi ills. matter cover professional-le te but somet te but somet and presenta ntion of som lacking com o draw some nal and prese little relevant professional- y to inapprof	Show strong a level problem ut conclusions red. Show evievel problem sons to real-watter covered. Stevel problem stimes erroneoutional skills. The relevant inforpetence in problem stimes appropentational skills tinformation, elevel problem priate and usu	analytical an a solving. Cs to real-wor didence of a solving. Use or old proble Show some solving. Use us conclusion mation, of ofessional-lorgate but to a of limited e of the subject solving. Use ually errone.	Examination d critical abilities an ritically use lab skill d problems. Demo nalytical and critica e lab skills and tech ms. Demonstrate evidence of analytie lab skills and tech ons to real-world pi f the subject matter evel problem solvir ften erroneous con	d log ls and	ec ical thinking, with d techniques and te highly effective lilities and logical is and analysis of tive team-based and critical abilities is and analysis of ms. Demonstrate ered. Show some se lab skills and ons to real-world v lack of coherent is and analysis of

Course Teaching	Activities	Details		No. of Hours
& Learning Activities	Lectures			24
	Laboratory			24
	Tutorials			6
	Reading / Self study			100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments	Laboratory	20	CLO 1,2,3,4,5
	Examination		40	CLO 1,2,3,4,5
	Test		40	CLO 1,2,4,5
Required/recommended reading and online materials			Practice (Van Nostrand Reinhold, 1 s (Jones & Barlett, 2000, 2nd ed.)	994, 3rd ed.)
Course Website	http://moodle.hku.hk/			
Additional Course Information	This course will be offered sub	ject to a minimum enrollment	number and availability of teachers	S.

BIOL3210	Grain pr	oduction and	utilizatio	n (6 credits)		Academic Year	2020
Offering Department	Biological			. ,		Quota	40
Course Co-ordinator		rke, Biological Sci	iences (ha	rold @hku.hk)			
Teachers Involved		, 0	,	,			
Course Objectives	To provide	e a broad underst	tanding of	the utilization and significa	ance of the majo	r grains in the foo	od industry and
•	human he	alth and nutrition.		· ·	,		·
Course Contents	- Global gr	rain production an	nd consum	ption			
& Topics	- The Gree	en Revolution and	d its afterm	ath			
		onal grain trade					
				, the baking process, bakin			
				uding steamed bread and	noodles		
		small-scale tests for	. ,	eferences, milling, quality,	quality testing	oroducte	
				al feed development	quality testing, j	oroducis	
		focusing on bioeth		arreed development			
		•		the grain processing indus	strv will be discu	ssed	
Course Learning				se, students should be able	•		
Outcomes	CLO 1 ur	nderstand the maj	jor product	ion, import, and export pat	terns that suppo	rt the global utiliz	ation of grain
	CLO 2 ur	nderstand the tech	hnology be	hind the production of grai	in-based foods		-
				ture of professional level q		grain products	
				global food sufficiency			
	CLO 5 ap	opreciate the ethic	cal issues	behind the diversion of gra	in into meat and	biofuel productio	n
Pre-requisites	Pass in an	ny level 2 BIOL co	ourse				
(and Co-requisites							
and Impermissible							
combinations)	N Off	: 0004 0000	. NI			F	
Offer in 2020 - 2021		er in 2021 - 2022				Examination	
Grade Descriptors	Α			the subject matter covered. Show competence in professional-leve			
(A+ to F)		analysis of data and	d results to d	raw appropriate and insightful co			
		team-based organizational and presentational skills.					
	В	Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities and logical thinking with some evidence of competence in professional-level problem solving. Use lab skills and techniques and analysis of					
		data and results to draw generally appropriate conclusions to real-world problems. Demonstrate effective team-based					
		organizational and presentational skills. C Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of analytical and critical abilities					
	C	and logical thinking with limited competence in professional-level problem solving. Use lab skills and techniques and analysis of					
	data and results to draw moderately appropriate but sometimes erroneous conclusions to real-world problems. Demonstrate						
	moderately effective team-based organizational and presentational skills. Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Show some					iono to roai trona pri	obiemo. Demonona
	D	Demonstrate nartial		organizational and presentational		·	
	D		but limited	organizational and presentational	levant information, o	of the subject matter	covered. Show som
	D	evidence of cohere techniques and ana	but limited on the limited of the li	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime	levant information, once in professionales appropriate but o	of the subject matter level problem solving often erroneous cond	covered. Show som g. Use lab skills an
		evidence of cohere techniques and and problems. Demonstr	I but limited on the second limited on the second limited in the second limited limited in the second limited organizational and presentational grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentati	levant information, once in professionales appropriate but of ional skills of limited	of the subject matter level problem solving often erroneous cond effectiveness.	covered. Show som g. Use lab skills an lusions to real-worl	
	D Fail	evidence of cohere techniques and and problems. Demonstr Demonstrate little of	I but limited on and logicallysis of data rate team-barrangers, v	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime	levant information, once in professional es appropriate but of ional skills of limited prmation, of the subj	of the subject matter elevel problem solving often erroneous conc effectiveness. ect matter covered. S	covered. Show som g. Use lab skills an clusions to real-worl
		evidence of cohere techniques and and problems. Demonstr Demonstrate little of and logical thinking, data and results in	I but limited gent and logicallysis of datarate team-barr no grasp, vand minimal	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentati vith retention of little relevant info competence in professional-leve eading generally to inappropriate	levant information, once in professionales appropriate but of ional skills of limited promation, of the subjet problem solving. Up and usually erron	of the subject matter level problem solving often erroneous cond effectiveness. ect matter covered. S se lab skills and techr	covered. Show som g. Use lab skills an clusions to real-worl show lack of coheren iques and analysis
Course Type	Fail	evidence of cohere techniques and and problems. Demonstr Demonstrate little of and logical thinking, data and results in Demonstrate ineffect	I but limited gent and logicallysis of datarate team-barr no grasp, vand minimal	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentati vith retention of little relevant info competence in professional-leve	levant information, once in professionales appropriate but of ional skills of limited promation, of the subjet problem solving. Up and usually erron	of the subject matter level problem solving often erroneous cond effectiveness. ect matter covered. S se lab skills and techr	covered. Show som g. Use lab skills an clusions to real-worl show lack of coheren iques and analysis
Course Type	Fail Lecture-ba	evidence of cohere techniques and and problems. Demonstr Demonstrate little of and logical thinking, data and results in Demonstrate ineffect ased course	I but limited on and logicallysis of data rate team-bar no grasp, vand minimal effectively, lectiveness team	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentati rith retention of little relevant info competence in professional-leve eading generally to inappropriate m-based organizational and presentations.	levant information, once in professionales appropriate but of ional skills of limited promation, of the subjet problem solving. Up and usually erron	of the subject matter level problem solving often erroneous cond effectiveness. ect matter covered. S se lab skills and techr	covered. Show som g. Use lab skills an dusions to real-worl show lack of coheren iques and analysis real-world problems
Course Teaching	Fail Lecture-ba	evidence of cohere techniques and and problems. Demonstr Demonstrate little of and logical thinking, data and results in Demonstrate ineffect ased course	I but limited on and logicallysis of data rate team-bar no grasp, vand minimal effectively, lectiveness team	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentati vith retention of little relevant info competence in professional-leve eading generally to inappropriate	levant information, once in professionales appropriate but of ional skills of limited promation, of the subjet problem solving. Up and usually erron	of the subject matter level problem solving often erroneous cond effectiveness. ect matter covered. S se lab skills and techr	covered. Show som g. Use lab skills an dusions to real-worl show lack of coherent iques and analysis real-world problems
	Fail Lecture-ba Activities Lectures	evidence of cohere techniques and and problems. Demonstr Demonstrate little of and logical thinking, data and results in Demonstrate ineffect ased course	I but limited on and logicallysis of data rate team-bar no grasp, vand minimal effectively, lectiveness team	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentati rith retention of little relevant info competence in professional-leve eading generally to inappropriate m-based organizational and presentations.	levant information, once in professionales appropriate but of ional skills of limited promation, of the subjet problem solving. Up and usually erron	of the subject matter level problem solving often erroneous cond effectiveness. ect matter covered. S se lab skills and techr	covered. Show som g. Use lab skills an dusions to real-worl show lack of coherent iques and analysis real-world problems No. of Hours 36
Course Teaching	Fail Lecture-ba Activities Lectures Tutorials	evidence of cohere techniques and and problems. Demonstr Demonstrate little on and logical thinking, data and results in Demonstrate ineffect ased course	I but limited on and logicallysis of data rate team-bar no grasp, vand minimal effectively, lectiveness team	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentati rith retention of little relevant info competence in professional-leve eading generally to inappropriate m-based organizational and presentations.	levant information, once in professionales appropriate but of ional skills of limited promation, of the subjet problem solving. Up and usually erron	of the subject matter level problem solving often erroneous cond effectiveness. ect matter covered. S se lab skills and techr	covered. Show som g. Use lab skills an elusions to real-worl show lack of coheren iques and analysis real-world problems No. of Hours 36 12
Course Teaching & Learning Activities	Fail Lecture-ba Activities Lectures Tutorials Reading /	evidence of cohere techniques and and problems. Demonstr Demonstrate little of and logical thinking, data and results in Demonstrate ineffec- ased course	but limited sent and logicallysis of datarate team-barr no grasp, vand minimal effectively, letiveness team	organizational and presentational graps, with retention of some relational thinking, but lacking compete and results to draw sometime sed organizational and presentation of little relevant info competence in professional-leve pading generally to inappropriate m-based organizational and presentational services.	levant information, once in professional- ses appropriate but onal skills of limited ormation, of the subjet or problem solving. Use and usually erron entational skills.	of the subject matter level problem solving often erroneous conc effectiveness. ect matter covered. S se lab skills and techr eous conclusions to	covered. Show som g. Use lab skills an elusions to real-worl show lack of coheren iques and analysis real-world problems No. of Hours 36 12 100
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials	evidence of cohere techniques and and problems. Demonstr Demonstrate little of and logical thinking, data and results in Demonstrate ineffec- ased course	but limited sent and logicallysis of datarate team-barr no grasp, vand minimal effectively, letiveness team	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentati rith retention of little relevant info competence in professional-leve eading generally to inappropriate m-based organizational and presentations.	levant information, once in professional ses appropriate but onal skills of limited ormation, of the subject problem solving. Ue and usually erronentational skills. Weigh	of the subject matter level problem solving often erroneous conc effectiveness. ect matter covered. S se lab skills and techr eous conclusions to	covered. Show som g. Use lab skills an elusions to real-worl show lack of coherer inques and analysis or real-world problems No. of Hours 36 12 100 Assessment
Course Teaching & Learning Activities	Fail Lecture-ba Activities Lectures Tutorials Reading /	evidence of cohere techniques and and problems. Demonstr Demonstrate little of and logical thinking, data and results in Demonstrate ineffec- ased course	but limited sent and logicallysis of datarate team-barr no grasp, vand minimal effectively, letiveness team	organizational and presentational graps, with retention of some relational thinking, but lacking compete and results to draw sometime sed organizational and presentation of little relevant info competence in professional-leve pading generally to inappropriate m-based organizational and presentational services.	levant information, once in professional ses appropriate but onal skills of limited ormation, of the subject problem solving. Ue and usually erronentational skills. Weigh	of the subject matter level problem solving often erroneous conc effectiveness. ect matter covered. S se lab skills and techr eous conclusions to ting in final e grade (%)	covered. Show som g. Use lab skills an ilusions to real-worl show lack of coherer inques and analysis real-world problems No. of Hours 36 12 100 Assessment Methods
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods	evidence of cohere techniques and and problems. Demonstr Demonstrate little on and logical thinking, data and results in Demonstrate ineffect assed course	but limited sent and logicallysis of datarate team-barr no grasp, vand minimal effectively, letiveness team	organizational and presentational graps, with retention of some relational thinking, but lacking compete and results to draw sometime sed organizational and presentation of little relevant info competence in professional-leve pading generally to inappropriate m-based organizational and presentational services.	levant information, once in professional ses appropriate but onal skills of limited ormation, of the subject problem solving. Ue and usually erronentational skills. Weigh	of the subject matter level problem solving often erroneous conc effectiveness. ect matter covered. S se lab skills and techr eous conclusions to ting in final e grade (%)	covered. Show som g. Use lab skills an llusions to real-worl show lack of coherer inques and analysis real-world problems No. of Hours 36 12 100 Assessment Methods to CLO Mappine
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods	evidence of cohere techniques and and problems. Demonstr Demonstrate little of and logical thinking, data and results in Demonstrate ineffect ased course	but limited sent and logical salvsis of datarate team-barr no grasp, vand minimal effectively, lettiveness team	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentativith retention of little relevant info competence in professional-leve eading generally to inappropriate m-based organizational and presentativities.	levant information, once in professional ses appropriate but onal skills of limited ormation, of the subject problem solving. Ue and usually erronentational skills. Weigh	of the subject matter level problem solving often erroneous conc effectiveness. ect matter covered. S se lab skills and techr eous conclusions to ting in final e grade (%)	covered. Show som g. Use lab skills an ilusions to real-worl show lack of coheren iques and analysis real-world problems No. of Hours 36 12 100 Assessment Methods to CLO Mappine CLO 1,2,3,4,5
Course Teaching & Learning Activities Assessment Methods and Weighting	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Examinati Project re	evidence of cohere techniques and and problems. Demonstra Demonstrate little of and logical thinking, data and results in Demonstrate ineffect ased course S Self study	but limited and logic lays of dat rate team-bar r no grasp, v and minimal effectively, lettiveness team	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentativith retention of little relevant info competence in professional-leve eading generally to inappropriate m-based organizational and presentativith retentions of little relevant info competence in professional-leve eading generally to inappropriate m-based organizational and presentations.	levant information, once in professional- se appropriate but of ional skills of limited ormation, of the subjet problem solving. Use and usually erron entational skills. Weigh course	of the subject matter elevel problem solving often erroneous conc effectiveness. ect matter covered. S se lab skills and tech eous conclusions to ting in final e grade (%) 70 30	covered. Show som g. Use lab skills an illusions to real-worl show lack of coheren iques and analysis real-world problems No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5 CLO 2,3
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Examinati Project re Encyclope	evidence of cohere techniques and ana problems. Demonstra Demonstrate little or and logical thinking, data and results in Demonstrate ineffect ased course Self study ion ports dia of Grain Scie	but limited and logic land and logic land allysis of data rate team-bar r no grasp, v and minimal effectively, lettiveness team De De land land land land land land land land	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentativith retention of little relevant info competence in professional-leve eading generally to inappropriate m-based organizational and presentativitals.	levant information, once in professional- se appropriate but of ional skills of limited ormation, of the subjet problem solving. Use and usually erron entational skills. Weigh course	of the subject matter elevel problem solving often erroneous conc effectiveness. ect matter covered. S se lab skills and tech eous conclusions to ting in final e grade (%) 70 30	covered. Show som g. Use lab skills an illusions to real-worl show lack of coheren iques and analysis real-world problems No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5 CLO 2,3
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Examinati Project re Encyclope Elsevier, 0	evidence of cohere techniques and and problems. Demonstra Demonstrate little of and logical thinking, data and results in Demonstrate ineffect ased course S Self study	but limited and logic land allysis of data rate team-bar r no grasp, v and minimal effectively, lativeness team De	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentativith retention of little relevant info competence in professional-leve eading generally to inappropriate m-based organizational and presentativitals.	levant information, once in professional- se appropriate but of ional skills of limited ormation, of the subjet problem solving. Use and usually erron entational skills. Weigh course	of the subject matter elevel problem solving often erroneous conc effectiveness. ect matter covered. S se lab skills and tech eous conclusions to ting in final e grade (%) 70 30	covered. Show som g. Use lab skills an illusions to real-worl show lack of coheren iques and analysis real-world problems No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5 CLO 2,3
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Examinati Project re Encyclope Elsevier, C Other read	evidence of cohere techniques and ana problems. Demonstra Demonstrate little or and logical thinking, data and results in Demonstrate ineffect ased course Self study Self study ion ports dia of Grain Scie Dxford. (selected of dings to be provid	but limited and logic land allysis of data rate team-bar r no grasp, v and minimal effectively, lativeness team De	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentativith retention of little relevant info competence in professional-leve eading generally to inappropriate m-based organizational and presentativitals.	levant information, once in professional- se appropriate but of ional skills of limited ormation, of the subjet problem solving. Use and usually erron entational skills. Weigh course	of the subject matter elevel problem solving often erroneous conc effectiveness. ect matter covered. S se lab skills and tech eous conclusions to ting in final e grade (%) 70 30	covered. Show som g. Use lab skills an illusions to real-worl show lack of coheren iques and analysis real-world problems No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5 CLO 2,3
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Examinati Project re Encyclope Elsevier, C Other reachttp://mood	evidence of cohere techniques and ans problems. Demonstra Demonstrate little or and logical thinking, data and results in Demonstrate ineffect ased course S Self study ion ports edia of Grain Scie Dxford. (selected of dings to be provid- dle.hku.hk/	but limited gent and logic ladys of dat rate team-bar r no grasp, v and minimal effectively, lettiveness team lady lady lady lady lady lady lady lady	organizational and presentationa grasp, with retention of some rel al thinking, but lacking compete a and results to draw sometime sed organizational and presentativith retention of little relevant info competence in professional-leve eading generally to inappropriate m-based organizational and presentativities.	levant information, once in professional sea appropriate but of ince in season of the subject of	of the subject matter level problem solving often erroneous conc effectiveness. ect matter covered. S se lab skills and techr eous conclusions to ting in final e grade (%) 70 30 E (2004) 3 Volum	covered. Show som g. Use lab skills an illusions to real-worl show lack of coheren iques and analysis real-world problems No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5 CLO 2,3

BIOL3211	Nutrigen	nomics (6 credits)		Academic Yea	r 2020
Offering Department	Biological			Quota	40
Course Co-ordinator	Dr K C Ta	n-Un, Biological Science	es (kctanun@hku.hk)		
Teachers Involved	(Dr K C Ta	an-Un,Biological Science	es)		
Course Objectives	called Nuti	rigenomics. This course ing the science of nutrit	anding of the human genome had eaims to provide students with a ion and the relation between ge and the concepts of nutrigenomic	an understanding of the biochenes and diet-related diseases.	emical mechanisms
Course Contents	Concepts	of nutrigenomics, nutrig	enetics, metabolomics and nutri	tional biochemistry.	
& Topics	Overview of Relevance Epigenetic predisposi Polyunsatu pathways;	of lipid metabolism; cho e of folate, vitamin B12; cs, Barker s hypothesi ition, candidate genes lil urated fatty acid and the	ingle Nucleotide Polymorphisms ilesterol metabolic pathway; hyperhomocysteinemia and geris, influence of maternal nutritive leptin, FTO and other hormore ir roles in the control of gene executed to the second of	erlipidaemia, LDL receptor muine polymorphisms in diseases. ion in fetal gene expression nes involved in the control of appression example lipogenesis	. Obesity, genetic opetite
Course Learning	On succes	sful completion of this of	course, students should be able	to:	
Outcomes		•	ne control of gene expression		
	dis	sease	ng of the role of metabolic pathy		·
			tions are used to study the role		lular processes
			etween genotype, epigenetics an		
		,	theories of personalized nutritior	n based on individual genetic v	ariation
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Bl	OC2600 or BIOL2220 o	or MEDE2301		
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20	022 : Y	Examination	Dec
Grade Descriptors (A+ to F)	A Demonstrate thorough grasp of the subject matter covered. Show extensive ability of knowledge integration and problem solving skills. Show excellent ability to critically analyze and interpret complex scientific data and draw appropriate conclusions. Demonstrate highly effective organization and writing skills. B Demonstrate substantial grasp of the subject matter covered. Show substantial ability of knowledge integration and problem solving skills. Show substantial ability to critically analyze and interpret scientific data and draw appropriate conclusions. Demonstrate effective organization and writing skills. C Demonstrate general and acceptable grasp of the subject matter covered. Show acceptable ability of knowledge integration and problem solving skills. Show moderate ability to analyze and interpret scientific data and draw proper conclusions. Demonstrate				
	moderate organization and writing skills. Demonstrate marginal grasp of the subject matter covered. Show limited ability on knowledge integration and problem solving				
	Fail Skills. Show limited ability to analyse and interpret scientific data. Demonstrate basic organization and writing skills. Demonstrate little or no grasp, with little retention of information of the subject matter covered. Show lack of coherent and logica thinking, and minimal evidence in problem solving. Fail to integrate information and identify problems. Show little or minimal ability to analyze and interpret scientific data and draw conclusions. Demonstrate poor organization and writing skills.				
Course Type	Lecture-ba	ased course		1 3	J
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures				36
	Tutorials		student-centered learning		12
		Self study	Stadent Contorca learning		100
Assessment Methods and Weighting	Methods	Con Study	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignme	ents		20	CLO 1,2,3,4,5
	Examinati			60	CLO 1,2,3,4,5
	Test			20	CLO 1
Required/recommended reading and online materials	Lehninger Ordovas: N Brigelius-F	Fuchs, Packer: Nutriger	genomics. Wiley. 2004 Genomics. Wiley. 2006. nomics, CRC Press. 2005		
	Journals in	n Nutrition Molecular Ri	ology and Genetics		
Course Website		ո Nutrition, Molecular Bi dle.hku.hk/	ology and Genetics		

BIOL3215	Principles of dietary assessment (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	30
Course Co-ordinator	Dr J C Y Louie, Biological Sciences (jimmyl@hku.hk)		
Teachers Involved	(Dr J C Y Louie, Biological Sciences)		
Course Objectives	This course examines the various methods used to measure dietary intake in p how to assess these measurements against international standards, and ho improvement.		
Course Contents & Topics	Topics covered will include the validity and reliability of different methods, estimuse of food composition databases, nutrition screening tools and the plannin monitoring and evaluation. Students will conduct project work and produce and using dietary assessment tools.	g and use of nati	ional surveys for
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 understand the principles of dietary assessment methods, and the streng CLO 2 evaluate the validity and reliability of dietary assessment tools CLO 3 choose the most appropriate nutrition assessment methods for different CLO 4 explain the meaning and uses of Dietary Reference Intakes CLO 5 competently use dietary assessment software with local and internation individual dietary intake	purposes	

		ecommendation(s) for i				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	BIOL2102				
Offer in 2020 - 2021	N Of	ffer in 2021 - 2022 : N		Examination		
Grade Descriptors (A+ to F)	A	A Demonstrate thorough grasp of the subject matter covered. Show strong analytical and critical abilities and logical thinking, with evidence of creative ability and competence in professional-level problem solving. Critically use practical skills and techniques and analysis of data and results to draw appropriate and insightful conclusions to real-world problems. Demonstrate highly effective team-based organizational and presentational skills.				
	В	thinking with some evide	grasp of the subject matter covered. ence of competence in professional-le lts to draw generally appropriate conclu- ntational skills.	vel problem solving. Use practical sk	tills and techniques and	
	С	and logical thinking with analysis of data and res	incomplete grasp of the subject matter limited competence in professional-le- sults to draw moderately appropriate the effective team-based organizational and	evel problem solving. Use practical skout sometimes erroneous conclusions	ills and techniques and	
	D					
	Fail	Demonstrate little or no g and logical thinking, and analysis of data and res	grasp, with retention of little relevant inf minimal competence in professional- ults ineffectively, leading generally to neffectiveness team-based organization	ormation, of the subject matter covere- evel problem solving. Use practical sl inappropriate and usually erroneous of	kills and techniques and	
Course Type	Laborato	ry and workshop cours	Ţ ,	·		
Course Teaching	Activities		Details	No. of Hours		
& Learning Activities	Workshops				No. or riours	
	VVOIKSIIC	ppo			48	
· ·	Tutorials					
·	Tutorials				48	
	Tutorials	Self study	Details	Weighting in final course grade (%)	48 12	
	Tutorials Reading Methods	Self study	Details		48 12 90 Assessment Methods	
	Tutorials Reading Methods	s / Self study s	Details Group presentation	course grade (%)	48 12 90 Assessment Methods to CLO Mapping	
	Tutorials Reading Methods	s / Self study s ory reports		course grade (%)	48 12 90 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6	
	Tutorials Reading Methods Laborato Presenta	s / Self study s ory reports		course grade (%) 40 10	48 12 90 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3	
and Weighting	Tutorials Reading Methods Laborato Presenta Project re Test	S / Self study S / Self study ory reports ation reports		40 10 30	48 12 90 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3 CLO 1,2,3,4	
and Weighting Required/recommended reading and	Laborato Presenta Project re Test Required Lee RD a Gibson R Online m Institute	s / Self study s ory reports ation eports I: and Nieman DC, Nutritic RS, Principles of Nutritic interials: of Medicine (US) Food		course grade (%) 40 10 30 20 aw Hill d University Press Reference Intakes: A Risk As	48 12 90 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3 CLO 1,2,3,4 CLO 1,2,3,4	
Assessment Methods and Weighting Required/recommended reading and online materials Course Website	Laborato Presenta Project re Test Required Lee RD a Gibson a Online m Institute a Establish	s / Self study s ory reports ation eports I: and Nieman DC, Nutritic RS, Principles of Nutritic interials: of Medicine (US) Food	Group presentation onal Assessment 6th Ed. McGra onal Assessment 2nd Ed. Oxford d and Nutrition Board. Dietary	course grade (%) 40 10 30 20 aw Hill d University Press Reference Intakes: A Risk As	48 12 90 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3 CLO 1,2,3,4 CLO 1,2,3,4	

BIOL3216	Food waste management (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	30
Course Co-ordinator	Dr O Habimana, Biological Sciences (ohabim@hku.hk)		
Teachers Involved	(Dr O Habimana, School of Biological Sciences)		
Course Objectives	To allow students to develop an understanding of the propagation, treatment a within the farm to table chain. To allow students to critically evaluate food recovery potential in Hong Kong in comparison to other countries in Asia/Worldw	waste ['] manageme vide.	ent and resource
Course Contents & Topics	With our current global population estimated to reach 9.1 billion in 2050, for increase by 70% to meet food demand. However, our current world food supply of all food produced for human consumption lost or wasted. This amounts to a per year! Clearly we should be worried about food wastage. In this course, the social, economic, and environmental implications associated by presenting relevant facts and figures and case studies embodying agriculture types. Basic waste management concepts will also be covered, examining current compared to other countries in Asia, while providing the basis for exported to the countries in Asia, while providing the basis for exported to exported to other countries in Asia, while providing the basis for exported to exported to other countries in Asia, while providing the basis for exported to exported to exported the basis for exported to exported the providing the basis for exported to exported the providing the basis for exported to exported the basis for exported to exported the basis for exported to exported the basis for exported to exported the basis for exported to exported the basis for exported to exported the basis for exported to exported the basis for exported the basis for exported the basis for exported to exported the basis for exported the basis	is instead declinir staggering 1 to 2 d with food waste ral, industrial and arrent waste mana amining our own	ng, with 1/4 to 1/3 billion metric tons will be identified, consumer waste- agement in Hong personal waste
Course Learning	On successful completion of this course, students should be able to:		
Outcomes	CLO 1 understand and define the various types of waste as well as create footprint. CLO 2 be able to define the 3 R's in waste management (reduce, reuse, recycle).		
	polices in Hong Kong compared to other countries in Asia /Worldwide.		
	CLO 3 be able to describe current and novel technologies for treating waste, value added resources.		
	CLO 4 to develop written and oral presentation skills necessary to effectively social information related to waste management.	convey technical	, economic, and

Pre-requisites (and Co-requisites	Pass in	BIOL2101 or BIOL3201				
and Impermissible combinations)						
Offer in 2020 - 2021	Y 21	nd sem Offer in 2021 -	2022 : Y	Examination	May	
Grade Descriptors (A+ to F)	A	evidence of creative ability techniques and analysis of	sp of the subject matter covered. Show and competence in professional-level data and results to draw appropriate and results to draw appropriate and organizational and presentational skills	problem solving. Critically use quality nd insightful conclusions to real-world	management skills and	
	В					
	С	and logical thinking with lin	ncomplete grasp of the subject matter or nited competence in professional-level pr esults to draw moderately appropriate b ffective team-based organizational and p	roblem solving. Use quality managemout sometimes erroneous conclusions	ent skills and techniques	
	D					
	Fail	and logical thinking, and techniques and analysis of	asp, with retention of little relevant informinimal competence in professional-led data and results ineffectively, leading gonstrate ineffectiveness team-based organizations.	evel problem solving. Use quality of enerally to inappropriate and usually e	management skills and	
Course Type	Lecture-	based course				
Course Teaching	Activiti	es	Details		No. of Hours	
& Learning Activities	Lecture	S			36	
	Tutorial	S	including presentation		12	
	Group v	vork			30	
	Reading	g / Self study			100	
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examin	ation		40	CLO 1,2,3	
	Test		continuous assessment	60	CLO 1,2,3,4	
Course Website	http://mo	oodle.hku.hk				
Additional Course Information			ct to a minimum enrolment numb	er and availability of teachers.		

BIOL3217	Food, environment and health (6 credits)	Academic Yea	r 2020
Offering Department	Biological Sciences	Quota	50
Course Co-ordinator	Dr T. Sobko, Biological Sciences (tsobko@hku.hk)		
Teachers Involved	(Dr T Sobko, School of Biological Sciences)		
Course Objectives	A cross-disciplinary exploration of the environmental, socio-economic, public of food systems. To focus on how our food choices influence the environm our diet. To examine the interactions among environment (e.g. pollution, so food resources (growth, production, consumption, processing, distribution an	ent and how the en oil and water quality	vironment impacts , climate change),
Course Contents & Topics	The environment, human well-being and the functioning of society are high consumption. Are we destroying the environment as we struggle to feed grobecoming increasingly toxic for our health? The course will consist of the consumption on the environment; 2) The impact of environment on food an improve these interactions, through evidence-based case examples approach will be used with emphasis on 'real-life' cases connecting human health. Topics will include impacts of certain dietary habits and demands on sources of calories, rise of meat consumption, demand for year-round luxur increased fertilizers' use. We will consider how toxins, known as xenobiotics, decisions are influenced by the environment. The holistic approach used will environmental and food-related decisions and expressions, both public and evaluate the sociocultural, socio-behavioural, ethical and economic aspunderstand the importance of biologically sustainable food production and highealthy individual, environment and overall society.	owing populations? ree blocks: 1) The d human health, ar. A Problem Base-nutrition, well-being food systems (e.g. y foods) and the de affect human health help the students to private. Students weets of food and	Is the environment influence of food and 3) What actions declarating (PBL) and environmental demand for cheap epletion of soil and an and how sensory of navigate complex ill learn to critically environment and
Course Learning	On successful completion of this course, students should be able to:		
Outcomes	CLO 1 To understand multifactorial and interdisciplinary relations in sustaina	ıble environment an	d nutrition
	CLO 2 To address today's national and global challenges in the environmen	tal and food sectors	
	CLO 3 To understand historical and current aspects (agricultural production worldwide	, policy initiatives) l	ocally, in Asia and
	CLO 4 To address and analyze food/environment issues including food fulfilment of the right to adequate food; strengths and weaknesse policies and other interventions		
	CLO 5 To demonstrate skills to become effective environmental educators to environment to a variety of audiences and to apply theoretical known intervention in public setting		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOL 2101 or ENVS2001 or ENVS2002 or BIOL3201		
Offer in 2020 - 2021	Y 2nd sem Offer in 2021 - 2022 : Y	Examination	No Exam
Grade Descriptors (A+ to F)	Demonstrate thorough grasp of the subject matter covered. Show strong analytic evidence of creative ability and competence in professional-level problem solvin techniques and analysis of data and results to draw appropriate and insightful confighly effective team-based organizational and presentational skills.	g. Critically use quality r	nanagement skills and
	B Demonstrate substantial grasp of the subject matter covered. Show evidence thinking with some evidence of competence in professional-level problem solving and analysis of data and results to draw generally appropriate conclusions to re	. Use quálity managemei	nt skills and techniques

		based organizational and pr	resentational skills		
	С	and logical thinking with lim	ited competence in professiona	matter covered. Show some evidence of ana II-level problem solving. Use quality manager opriate but sometimes erroneous conclusion nal and presentational skills.	nent skills and techniques
	D	Demonstrate partial but limevidence of coherent and management skills and te	ited grasp, with retention of so I logical thinking, but lacking chniques and analysis of data	ome relevant information, of the subject mat g competence in professional-level proble a and results to draw sometimes appropri sed organizational and presentational skills of	m solving. Use quality ate but often erroneous
	Fail	and logical thinking, and techniques and analysis of	minimal competence in profe data and results ineffectively, le	ant information, of the subject matter covere ssional-level problem solving. Use quality adding generally to inappropriate and usually sed organizational and presentational skills.	management skills and
Course Type	Lecture-ba	ased course			
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures		with practicals		36
	Tutorials				12
	Project work				20
	Reading / Self study				50
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignme	ents		40	CLO 1,2,3,4,5
	Presentat	tion		10	CLO 4,5
	Project re	ports	Project	50	CLO 1,2,4,5
Required/recommended reading and online materials	There is n	o course textbook. Mos	t of the reading material v	will be provided on Moodle or distrib	uted during lectures.
Course Website	http://moo	dle.hku.hk			

BIOL3218	Food hy	giene and quality of	control (6 credits)	Academic Yea	ar 2020
Offering Department		Sciences	,	Quota	30
Course Co-ordinator	Dr O Hab	imana, Biological Scien	ces (ohabim@hku.hk)		
Teachers Involved	(Dr O Hal	bimana,School of Biolog	gical Sciences)		
Course Objectives			y management, microbiology ar	nd food processing concepts us	sed to produce safe
-	high-qual	ity food products. To in	troduce students to analysis and	d problem-solving of realistic bւ	ısiness situations i
		ty management.	•		
Course Contents & Topics Course Learning Outcomes	- Basic cc - Statistic - Quality I - Quality I - Develop food safe - Role of - A review - Religiou - Illustratir On succe CLO 1 ul CLO 2 b CLO 3 b	oncepts in TQM al Process Control Function Deployment management standards oment and implementati ty management system, environmental manager of of microbiology in a fo s, ethical, and cultural fi ve business case studie essful completion of this inderstand the basic mic e familiar with a set of n e able to analyze food p	on of a Hazard Analysis Critical / supply chain approach) nent systems (ISO 14000) in the od safety context	e food industry vill be discussed to: g concepts in food safety ble in the food industry for prom	noting food safety
	sa	afety	•		
Pre-requisites (and Co-requisites and Impermissible combinations)		IOL2101 or BIOL3201 oudents who have passe			
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2	2022 : Y	Examination	Dec
Grade Descriptors (A+ to F)	A	Demonstrate thorough gra evidence of creative ability techniques and analysis of	sp of the subject matter covered. Show y and competence in professional-level f data and results to draw appropriate a d organizational and presentational skills	strong analytical and critical abilities a problem solving. Critically use quality and insightful conclusions to real-world	and logical thinking, with management skills and
	B Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities and logical thinking with some evidence of competence in professional-level problem solving. Use quality management skills and techniques and analysis of data and results to draw generally appropriate conclusions to real-world problems. Demonstrate effective teambased organizational and presentational skills.				
	Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of analytical and critical abilities and logical thinking with limited competence in professional-level problem solving. Use quality management skills and techniques and analysis of data and results to draw moderately appropriate but sometimes erroneous conclusions to real-world problems. Demonstrate moderately effective team-based organizational and presentational skills.				
	D Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Show some evidence of coherent and logical thinking, but lacking competence in professional-level problem solving. Use quality management skills and techniques and analysis of data and results to draw sometimes appropriate but often erroneous conclusions to real-world problems. Demonstrate team-based organizational and presentational skills of limited effectiveness.				
	Fail	Demonstrate little or no gr and logical thinking, and techniques and analysis of	asp, with retention of little relevant info minimal competence in professional- f data and results ineffectively, leading g onstrate ineffectiveness team-based org	rmation, of the subject matter covered. level problem solving. Use quality n generally to inappropriate and usually e	. Show lack of coheren nanagement skills and
Course Type	Lecture-b	ased course			
Course Teaching	Activitie	S	Details		No. of Hours
Learning Activities	Lectures				36
-	Group we	ork			12
	Project w				
					30
		/ Self study			30 100

		course grade (%)	Methods to CLO Mapping
	Assignments	20	CLO 2
	Examination	50	CLO 1,2,3
	Project reports	30	CLO 2,3
Course Website	http://moodle.hku.hk		
Additional Course Information	The course will be offered subject to a minimum of	enrollment number and availability of teachers	S.

BIOL3301	warine L	piology (6 credits)		Acade	mic Year	2020
Offering Department	Biological			Quota		40
Course Co-ordinator	Dr M Yası	uhara, Biological Scienc	es (yasuhara@hku.hk)			
Teachers Involved	(Dr B Rus	sell,Biological Sciences)			
	,	uhara,Biological Scienc	,			
		nicii,Biological Sciences	,			
Course Objectives	of marine from mari	life, their function, ecolo	g and appreciation of the field ogy and inter-relationships. (s and threats to their long-to	Contemporary issues inclu	ıding the l	benefits we derive
Course Contents	The topics					
& Topics	temperatu 2. Importa and marin 3. Major m 4. Exploita	re, pH, dissolved oxyge ant groups of marine or e food web narine habitats and ecos ation of marine biologica	environments (e.g., light, on, nutrients) and how these reganisms (e.g., phytoplankto systems (e.g., intertidal, bential resources (e.g., fisheries are change, marine pollution	may affect the marine biot n, zooplankton, benthos, nic, pelagic, deep sea, cond nd bioactive compounds)	a nekton, r ral reefs, r	marine mammals
Course Learning		ssful completion of this of	course, students should be a	ble to:		
Outcomes	CLO 1 de	emonstrate a basic unde	erstanding of the diversity and	function of marine biota		
	CLO 2 red	cognize the interactions	of marine biota and their en	vironments		
	CLO 3 ap	preciate the importance	e of marine ecosystems and	the threats of human a	ctivities o	n their long-term
		istainability as well as po	ossible solutions			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BI	OL2306 or ENVS2002				
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2	022 : Y	Exami	nation	Dec
Grade Descriptors (A+ to F)	Α		stery at an advanced level of extern	nsive knowledge and skills req	uired for att	taining all the course
(7. 101)	В	to apply knowledge to a water presentational skills. Demonstrate substantial collearning outcomes. Show every substantial collearning outcomes.	strong analytical and critical abilities vide range of complex, familiar and emmand of a broad range of knowle vidence of analytical and critical ability	I unfamiliar situations. Apply hi edge and skills required for atta ities and logical thinking, and ab	nce of origin ighly effectivations at least	al thought, and ability re organizational and st most of the course
(2. 101)	В	to apply knowledge to a w presentational skills. Demonstrate substantial co- learning outcomes. Show et and some unfamiliar situatic Demonstrate general but i outcomes. Show evidence	wide range of complex, familiar and command of a broad range of knowled vidence of analytical and critical ability and critical ability. Apply effective organizational a incomplete command of knowledge of some analytical and critical ability.	I unfamiliar situations. Apply his edge and skills required for atta- ities and logical thinking, and ab- nd presentational skills. e and skills required for attain ties and logical thinking, and a	nce of origin ighly effectivations aining at least illity to apply ing most of	al thought, and ability ye organizational and st most of the course knowledge to familian
(2.101)		to apply knowledge to a w presentational skills. Demonstrate substantial co- learning outcomes. Show ev- and some unfamiliar situatic Demonstrate general but i outcomes. Show evidence familiar situations. Apply mc Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evic of analytical and critical ai	wide range of complex, familiar and command of a broad range of knowle vidence of analytical and critical ability. Apply effective organizational a incomplete command of knowledge of some analytical and critical ability of some analytical and critical ability of some analytical and critical ability of some analytical and critical ability of some analytical and critical ability of some analytical and coverational and ted command of knowledge and sherent and logical thinking, but with s. Apply limited or barely effective of dence of command of knowledge and bilities, logical and coherent thinki	I unfamiliar situations. Apply his edge and skills required for attaities and logical thinking, and abind presentational skills. and skills required for attainties and logical thinking, and ad presentational skills. Its equired for attaining some limited analytical and critical abinganizational and presentational diskills required for attaining thing. Show very little or no ability.	nce of origin ighly effective aining at least of the course of the course ilities. Show I skills. e course lea	all thought, and ability re organizational and st most of the course knowledge to familiar if the course learning by knowledge to most se learning outcomes. limited ability to apply arning outcomes. Lack
	C D Fail	to apply knowledge to a w presentational skills. Demonstrate substantial co- learning outcomes. Show evand some unfamiliar situation. Demonstrate general but i outcomes. Show evidence familiar situations. Apply mc Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evidence of analytical and critical al problems. Organization and	wide range of complex, familiar and command of a broad range of knowle vidence of analytical and critical abilions. Apply effective organizational a incomplete command of knowledge of some analytical and critical abilioderately effective organizational and ited command of knowledge and sherent and logical thinking, but with its. Apply limited or barely effective of demonstration of knowledge and sherent and logical thinking, but with its. Apply limited or barely effective of demonstration of knowledge are bilities, logical and coherent thinking presentational skills are minimally of the strategies.	I unfamiliar situations. Apply his edge and skills required for attaities and logical thinking, and abind presentational skills. and skills required for attainties and logical thinking, and ad presentational skills. Its equired for attaining some limited analytical and critical abinganizational and presentational diskills required for attaining thing. Show very little or no ability.	nce of origin ighly effective aining at least of the course of the course ilities. Show I skills. e course lea	all thought, and ability re organizational and st most of the course knowledge to familial f the course learning by knowledge to most se learning outcomes. limited ability to apply arning outcomes. Lack
Course Type	C D Fail	to apply knowledge to a w presentational skills. Demonstrate substantial co- learning outcomes. Show et and some unfamiliar situation. Demonstrate general but i outcomes. Show evidence familiar situations. Apply mc Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evidence of analytical and critical al problems. Organization and ith laboratory componer	wide range of complex, familiar and command of a broad range of knowle vidence of analytical and critical abilions. Apply effective organizational a incomplete command of knowledge of some analytical and critical abilioderately effective organizational and ited command of knowledge and sherent and logical thinking, but with its. Apply limited or barely effective of demonstration of knowledge and sherent and logical thinking, but with its. Apply limited or barely effective of demonstration of knowledge are bilities, logical and coherent thinking presentational skills are minimally of the strategies.	I unfamiliar situations. Apply his edge and skills required for attaities and logical thinking, and abind presentational skills. and skills required for attainties and logical thinking, and ad presentational skills. Its equired for attaining some limited analytical and critical abinganizational and presentational diskills required for attaining thing. Show very little or no ability.	nce of origin ighly effective aining at least of the course of the course ilities. Show I skills. e course lea	all thought, and ability re organizational and st most of the course knowledge to familial the course learning ly knowledge to most see learning outcomes. Ilimited ability to apply arning outcomes. Lack knowledge to solve
Course Type Course Teaching	C D Fail Lecture wi	to apply knowledge to a w presentational skills. Demonstrate substantial co- learning outcomes. Show et and some unfamiliar situation. Demonstrate general but i outcomes. Show evidence familiar situations. Apply mc Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evidence of analytical and critical al problems. Organization and ith laboratory componer	wide range of complex, familiar and command of a broad range of knowledge of analytical and critical abilions. Apply effective organizational a incomplete command of knowledge of some analytical and critical abilioderately effective organizational and ited command of knowledge and sherent and logical thinking, but with its. Apply limited or barely effective of depression of the command of knowledge and sherent and logical thinking, but with its. Apply limited or barely effective of depression of command of knowledge are bilities, logical and coherent thinking presentational skills are minimally entitle of the course	I unfamiliar situations. Apply his edge and skills required for attaities and logical thinking, and abind presentational skills. and skills required for attainties and logical thinking, and ad presentational skills. Its equired for attaining some limited analytical and critical abinganizational and presentational diskills required for attaining thing. Show very little or no ability.	nce of origin ighly effective aining at least of the course of the course ilities. Show I skills. e course lea	all thought, and ability re organizational and st most of the course knowledge to familian if the course learning by knowledge to most se learning outcomes. limited ability to apply arning outcomes. Lack
Course Type Course Teaching	C D Fail Lecture wi	to apply knowledge to a w presentational skills. Demonstrate substantial co- learning outcomes. Show evand some unfamiliar situation. Demonstrate general but i outcomes. Show evidence familiar situations. Apply mc Demonstrate partial but lim Show evidence of some col- knowledge to solve problem Demonstrate little or no evident and critical and problems. Organization and ith laboratory componer	wide range of complex, familiar and command of a broad range of knowle vidence of analytical and critical abilities. Apply effective organizational a incomplete command of knowledge of some analytical and critical abilities observed by the command of knowledge and sherent and logical thinking, but with its. Apply limited or barely effective of dence of command of knowledge are bilities, logical and coherent thinking presentational skills are minimally on the course petals.	I unfamiliar situations. Apply his adge and skills required for attaites and logical thinking, and abid presentational skills. e and skills required for attain ties and logical thinking, and ad presentational skills. It is required for attain ties and logical thinking, and ad presentational skills. It is required for attaining some limited analytical and critical abig and an additional and presentational diskills required for attaining thing. Show very little or no abiliffective or ineffective.	nce of origin ighly effective aining at least of the course of the course ilities. Show I skills. e course lea	al thought, and ability re organizational and st most of the course knowledge to familiar if the course learning ly knowledge to most see learning outcomes. Iimited ability to apply arming outcomes. Lack knowledge to solve
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Course Type Course Teaching & Learning Activities Assessment Methods	C D Fail Lecture wi Activities Lectures Field work	to apply knowledge to a w presentational skills. Demonstrate substantial co learning outcomes. Show et and some unfamiliar situatic Demonstrate general but i outcomes. Show evidence familiar situations. Apply mc Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evidence of some col knowledge to solve problem Demonstrate little or no evidence of some col knowledge to solve problem. Organization and ith laboratory componer is	wide range of complex, familiar and command of a broad range of knowle vidence of analytical and critical abilities. Apply effective organizational a incomplete command of knowledge of some analytical and critical abilities observed by the command of knowledge and sherent and logical thinking, but with its. Apply limited or barely effective of dence of command of knowledge are bilities, logical and coherent thinking presentational skills are minimally on the course petals.	I unfamiliar situations. Apply his adge and skills required for attaites and logical thinking, and abid presentational skills. e and skills required for attain ties and logical thinking, and ad presentational skills. It is required for attain ties and logical thinking, and ad presentational skills. It is required for attaining some limited analytical and critical abig and an additional and presentational diskills required for attaining thing. Show very little or no abiliffective or ineffective.	nce of origin ghly effective ining at least sillity to apply ing most of billity to apply of the course littles. Show a least sillity to apply to apply the course least initial to apply the course least into apply the course l	all thought, and ability re organizational and st most of the course knowledge to familiar if the course learning ly knowledge to most see learning outcomes. Iimited ability to apply arming outcomes. Lack knowledge to solve No. of Hours 24 30
Course Type Course Teaching & Learning Activities Assessment Methods	C D Fail Lecture wi Activities Lectures Field work Reading /	to apply knowledge to a w presentational skills. Demonstrate substantial colearning outcomes. Show ev and some unfamiliar situation Demonstrate general but i outcomes. Show evidence familiar situations. Apply mo Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evic of analytical and critical al problems. Organization and ith laboratory componer is	ommand of a broad range of knowledge and specific and critical abilities. Apply effective organizational a incomplete command of knowledge of some analytical and critical abilities of some analytical and critical abilities of some analytical and critical abilities derived a command of knowledge and sherent and logical thinking, but with the same of command of knowledge and sherent and logical thinking, but with the same of command of knowledge are billities, logical and coherent thinking presentational skills are minimally ent course Details field trip, laboratory practical	I unfamiliar situations. Apply his edge and skills required for attaities and logical thinking, and about presentational skills. e and skills required for attain ties and logical thinking, and ad presentational skills. ills required for attaining some limited analytical and critical abitimited analytical and critical abit granizational and presentational dskills required for attaining thing. Show very little or no abit effective or ineffective. Weighting in	nce of origin ghly effective ining at least sillity to apply ing most of billity to apply of the course littles. Show a least sillity to apply to apply the course least initial to apply the course least into apply the course l	all thought, and ability re organizational and st most of the course knowledge to familiar if the course learning ly knowledge to most se learning outcomes. Lack knowledge to solve No. of Hours 24 30 100 Assessment Methods
Course Type Course Teaching & Learning Activities Assessment Methods	C D Fail Lecture wi Activities Lectures Field work Reading / Methods	to apply knowledge to a w presentational skills. Demonstrate substantial colearning outcomes. Show ev and some unfamiliar situation Demonstrate general but i outcomes. Show evidence familiar situations. Apply mc Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evic of analytical and critical a problems. Organization and ith laboratory componer is	ommand of a broad range of knowledge and specific and critical abilities. Apply effective organizational a incomplete command of knowledge of some analytical and critical abilities of some analytical and critical abilities of some analytical and critical abilities derived a command of knowledge and sherent and logical thinking, but with the same of command of knowledge and sherent and logical thinking, but with the same of command of knowledge are billities, logical and coherent thinking presentational skills are minimally ent course Details field trip, laboratory practical	l unfamiliar situations. Apply his edge and skills required for attatities and logical thinking, and abind presentational skills. and skills required for attain ties and logical thinking, and a dipresentational skills. Ities and logical thinking, and a dipresentational skills and presentational skills. Ities and logical thinking, and a dipresentational and critical abinganizational and presentational diskills required for attaining thing. Show very little or no abilistictive or ineffective. Weighting in course grade	nce of origin ghly effective ining at least sillity to apply ing most of billity to apply of the course littles. Show a least sillity to apply to apply the course least initial to apply the course least into apply the course l	all thought, and ability re organizational and st most of the course knowledge to familiar if the course learning ly knowledge to most se learning outcomes. Ilmited ability to apply arming outcomes. Lack knowledge to solve No. of Hours 24 30 100 Assessment Methods to CLO Mapping
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	C D Fail Lecture wi Activities Lectures Field work Reading / Methods Assignme Examinati Levinton, x Nybakken Cummings H. V. Thur	to apply knowledge to a w presentational skills. Demonstrate substantial colearning outcomes. Show et and some unfamiliar situatic Demonstrate general but i outcomes. Show evidence familiar situations. Apply mc Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evidence of some col knowledge to solve problem Demonstrate little or no evidence of some col knowledge to solve problem. Organization and critical and problems. Organization and ith laboratory componer is solved to the solved solved to the solved solv	ommand of a broad range of knowledge and specific and critical abilities. Apply effective organizational a incomplete command of knowledge of some analytical and critical abilities of some analytical and critical abilities of some analytical and critical abilities derived a command of knowledge and sherent and logical thinking, but with the same of command of knowledge and sherent and logical thinking, but with the same of command of knowledge are billities, logical and coherent thinking presentational skills are minimally ent course Details field trip, laboratory practical	l unfamiliar situations. Apply his edge and skills required for attaites and logical thinking, and about presentational skills. e and skills required for attain ties and logical thinking, and addividual presentational skills. ills required for attaining some limited analytical and critical abitrogenizational and presentational skills required for attaining the granizational and presentational diskills required for attaining the granizational skills required for attaining the granizational skills required for attaining the granizational and presentational diskills required for attaining the granizational diskills.	nee of originity of originity of the course leading to apply of the course littles. Show a course leading to apply of the course leading to apply of the course leading to apply of the course leading to apply of the course leading to apply of the course leading to apply of the course leading to apply of the course leading to apply of the course leading to apply of the course leading to apply of the course leading to apply of the course leading to apply of the course leading to apply of the course leading to apply of the course leading to apply the course leading the course leading the course leading the course leading to apply the course leading the cou	all thought, and ability re organizational and st most of the course knowledge to familiar the course learning ly knowledge to most se learning outcomes. Imited ability to apply arning outcomes. Lack knowledge to solve No. of Hours 24 30 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3 niversity Press

BIOL3302	Systematics and phylogenetics (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	60
Course Co-ordinator	Prof R M K Saunders, Biological Sciences (saunders@hku.hk)		
Teachers Involved	(Prof R M K Saunders, Biological Sciences)		
Course Objectives	To give students an understanding of the principles of systematics and phyl current trends and controversies. Systematics forms an invaluable grounding franatomy, ecology, population biology and evolutionary biology), and enables techniques (including anatomy, biochemistry, chemistry, molecular biology, cytol	or many fields of l the integration of	biology (including a wide range of
Course Contents	Currrent classificatory theories: phenetic systematics (classifications based on o	verall resemblanc	es) and cladistics

& Topics	(evolutionary reconstruction). The species concept. Sources of taxonomic data: morphology & anatomy, biochemistry, chemistry, molecular biology, cytology, and ethology. Causes of taxonomies complexity: environmental factors; hybridization; breeding systems. Principles of nomenclature. Laboratory sessions will be aimed at illustrating taxonomic procedures and problems; students will not be expected to memorize large numbers of scientific names.					
Course Learning Outcomes	CLO 1 ex	•		ble to: ecies) and show how multivariate	e statistical methods	
	CLO 2 de	escribe the principles be	ehind maximum parsimony	methods of phylogenetic recorpoplasy and the assessment of cla		
	CLO 3 ev	aluate the diversity of so	ources of taxonomic data, an	d explain the importance of spec	cific data sources	
	CLO 4 re	cognise the main causes	s of taxonomic complexity, a	nd identify appropriate solutions		
		nderstand the principles re validly publish new na		interpret the previous applicatior	of scientific names	
Pre-requisites (and Co-requisites and Impermissible		IOL1309; and 2 BIOL course				
combinations)	Y 1st	Offer in 2024 20	222 . V	Evenination	Dee	
Offer in 2020 - 2021		sem Offer in 2021 - 20		Examination	Dec	
Grade Descriptors (A+ to F)	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining most or all of the course learning outcomes, with evidence of extensive background reading and use of named examples. Show evidence of significant critical abilities and logical thinking. Apply highly effective presentation skills. Demonstrate effective use of data and results to draw appropriate and insightful conclusions. Show evidence of integration of a wide range of appropriate theories, principles, evidence and techniques.				
	Demonstrate substantial command of knowledge required for attaining most of the course learning outcomes, with evidence of some background reading and use of named examples. Show evidence of critical abilities and logical thinking. Apply effective presentation skills. Demonstrate use of data and results to draw appropriate and insightful conclusions. Show evidence of general integration of appropriate theories, principles, evidence and techniques.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes, with evidence of limited background reading and use of named examples. Show evidence of some critical abilities and logical thinking. Apply moderately effective presentation skills. Demonstrate mostly correct use of data and results to draw appropriate and insightful conclusions. Show evidence of partial integration of appropriate theories, principles, evidence and techniques.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes, with insufficient evidence of background reading and use of named examples. Show evidence of limited abilities and logical thinking. Apply limited presentation skills. Demonstrate limited ability to use data and results to draw appropriate and insightful conclusions. Show evidence of limited integration of appropriate theories, principles, evidence and techniques.				
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes, with no evidence of background reading or use of named examples. Show little or no evidence of critical abilities and logical thinking. Presentational skills are minimally effective or ineffective. Misuse of data and results to draw appropriate conclusions. Little or no evidence of integration of appropriate theories, principles, evidence and techniques.					
Course Type	Lecture w	ith laboratory componen	t course			
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures			24		
	Laborato	•			24	
	Project w	ork			12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents		15	CLO 1,3,4,5	
	Examinat			70	CLO 1,2,3,4,5	
		ry reports		15	CLO 1,3	
Required/recommended reading and	E. Mayr &	P. D. Ashlock: Principle	s of Systematic Zoology (Mccs - A Phylogenetic Approac			
online materials	TBC	•	, ,	,		
Course Website	http://mod	dle.hku.hk				

BIOL3303	Conservation biology (6 credits)	Academic Year	2020			
Offering Department	Biological Sciences	Quota	100			
Course Co-ordinator	Dr T C Bonebrake, Biological Sciences (tbone@hku.hk)					
Teachers Involved	(Dr H Mummby,School of Biological Sciences) (Dr L A Ashton,School of Biological Sciences) (Dr S W Y Sin,School of Biological Sciences) (Dr T C Bonebrake,School of Biological Sciences)					
Course Objectives	To introduce students to the theory and practice of conservation and to understanding of practical, economic and management skills required for proultimate aim is to promote an understanding of the natural biodiversity, the manage them. We hope these will be your aims too, and that you will be able learn from the course to reduce the local, regional and global loss of biodiversity.	ficiency in conserva threats to it, and to to use the skills an	ation biology. Õu the best ways to			
Course Contents & Topics	rapid loss of biodive to all future hum This course also pr for management of I, multidisciplinary st ters whether the pat onmental science, f	nan generations. ovides insights to ptions to sustain cience which, like tient lives or dies				
	The course is designed to provide the knowledge, theories, and research relateaching focuses on biodiversity conservation, conservation issues associtheoretical underpinning of biodiversity conservation and an introduction to confuse emphasis on the integration of knowledge, skills and abilities that are reproblem based learning approach will require students to actively participal	ated with climate on servation legislation quired to practice o	change, the key n and economics conservation. Our			

outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, ability and synthesize information, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Show evidence of analytical and critical abilities and logical thinking, integration of materials a apply knowledge to shill and critical abilities and logical thinking, and ability. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate effective presentational skills. Evider attention to thoughtful and reflective thinking. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the could outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge familiar situations. Apply immediate analytical and critical abilities and list thinking. D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities and little integration. Show limited ability to apply knowledge to solve problems. Apply limited effectiveness in presentational attention to thoughtful and reflective thinking. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning out of analytical and critical abilities, logical and coherent thinking, Show very little or no ability to apply knowledge problems. Organization and presentational skills are minimally effective or ineffective. Course Type Course Type Lecture with laboratory component course Activities Details No. of Lectures Field work Group work Tutorials Reading / Self study Methods Details Weighting in final course grade (%) Methods Essay Details Weighting in final course grade (%) Essay Essay Lecture Show and a self-s		debate l	debate by researching.					
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Ourse treasite Http://Httouic.Httu.Ht	Course Website		oodle.hku.hk					

BIOL3305	Tropical and temperate marine ecology field course (6 credits)	Academic Year	2020				
Offering Department	Biological Sciences	Quota	22				
Course Co-ordinator	Dr B Russell, Biological Sciences (brussell@hku.hk)						
Teachers Involved	(Dr B Russell,Biological Sciences) (Dr S Cannicci,Biological Sciences)						
Course Objectives	This course uses a field-based approach to provide students with an advestuarine ecology in both tropical and temperate regions. Students will lear and then apply them to compare these ecosystems in Australia, experiencing course culminates with students developing field-based research projects to creative and innovative thinking to overcome problems for successful outcomes.	n scientific technique their similarities and answer ecological	es in Hong Kong d differences. The				
Course Contents & Topics	The course will cover the structure and function of mangrove forests, reefs both tropical and temperate regions. Students will be introduced to the conclectures and field trips in Hong Kong before travelling to northern and secosystems in the field. The lectures will provide students with background kr they will encounter, the structure and function of the systems and how hum techniques, logical experimental design, and good report writing practices. T in the field with students quantifying species richness, observing system sexperiments that they design themselves.	epts in the course the couthern Australia to converge about the earn activities degrade hese concepts will be	rough a series of experience the ecosystems which e them, sampling e drawn together				
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 demonstrate an understanding of the complexity and function of marine ecosystems. CLO 2 explain the role of physical and biological processes in shaping the similarities and differences amountaine ecosystems tropical and temperate regions. CLO 3 demonstrate skills for field sampling in marine and estuarine habitats.						
	CLO 4 demonstrate knowledge in hypothesis testing and experimental design. CLO 5 identify a range of marine species and their role in ecosystems.						
Pre-requisites	Pass in "C" or above in BIOL2306 or BIOL3301 or BIOL3303 or ENVS2001						

(and Co-requisites and Impermissible							
combinations)							
Offer in 2020 - 2021	N O	ffer in 2021 - 2022 : Y		Examination	n		
Grade Descriptors	Α		sp of the subject and relevant research tec				
(A+ to F)		skills. Ample evidence of in comparative perspective to	kground reading and case studies. Exempl idependent critical thought with excellent u o draw insightful and logical conclusions. ellent analytical argumentation. Excellent	se of a broad range of fundame Show outstanding abilities of in	ental concepts and broader dependent work, effective		
	В						
	С	relevant background reading critical thinking (although n	, but incomplete grasp of the subject and g and case studies, but no interest in learn ot always independent), with mostly good th mostly correct argumentation, but limited for degree level.	ing beyond the adequate averaguse of fundamental concepts to	e level. Evidence of logical draw logical conclusions.		
	D	research techniques. Some abilities of critical independent	of the subject, but only partial and with e familiarity with relevant case studies, but tent thinking. Ineffective presentation skills te conclusions. Work barely meets what is	at insufficient evidence of backg with generally weak logical arg	round reading and limited		
	Fail	No evidence of basic a r background reading and n	minimum grasp of the subject and the roof of amiliarity with any relevant examples a tation skills with poor argumentation and	minimum relevant research tec nd case studies. Inadequate ev	idence of coherent logical		
Course Type	Field car	mps					
Course Teaching	Activitie	Activities Details		No. of Hours			
& Learning Activities	Lectures	S	Pre-course lectures and field trip	20			
	Field work		80 hourse + travel time	80			
	Reading	Reading / Self study		40			
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm	nents	Presentation	20	CLO 1,2,3,4,5		
	Report		Field report (20%) + Project report (55%)	75	CLO 1,2,3,4,5		
	Test		Pre-trip quiz	5	CLO 1		
Required/recommended reading and online materials	Students	s will be directed to releva	ant scientific literature and website	5			
Course Website	http://mo	odle.hku.hk					
Additional Course Information	This course involves a two-week field course to Australia, one week in the Sydney (temperate region) and one week on Orpheus Island (tropical region). Students will be exposed to some harsh environmental conditions including working in contact with seawater, potentially cold and rainy weather. Orpheus Island can have an abundance of biting insects (mosquitos and sand flies).						
	There w costs.	There will be extra costs involved in the course, including but not limited to airfares, accommodation and meal costs.					
	Enrollme		se at the end of the add/drop perionto be booked in advance.	od of the second semester	because airfares and		

BIOL3313	Freshwater ecology (6 credits)	Academic Year	2020				
Offering Department	Biological Sciences	Quota	30				
Course Co-ordinator	TBC, Biological Sciences ()						
Teachers Involved	(TBC,School of Biological Sciences)						
Course Objectives	This course introduces freshwater science by integrating the physical and biological components of rivers and their drainage basins in the context of sustaining human livelihoods and biodiversity. Conservation and management of lakes and maintenance of water quality are considered also. Case studies are used to illustrate the principles of river science and human use of drainage basins. Emphasis will be placed upon conservation of freshwater biodiversity in Asia in the context of increasing human modification of ecosystems, habitat degradation and water scarcity.						
Course Contents & Topics	The amount of water on Earth is fixed. Less than 0.01% of the world's water hosts 10% of the Earth's species. Global water use has increased 300% sinc Earth's population; many people in Asia already face water stress. This co processes involved in the hydrological cycle and flow of water in drainag fluctuations, and describes the main longitudinal changes that occur along flows in freshwater ecosystems are described with particular reference to the and land and the relative importance of aquatic primary production versus en the land. The range of organisms associated with Asian fresh waters is i explained, and students will become familiar with some common Hong Kong sessions. The dependence of humans on freshwater ecosystems and the role explained, together with the causes and consequences of human modification for conservation of aquatic biodiversity. Finally the range of management is human impacts on freshwater ecosystems and maintain water quality is introduced.	e 1950 and is growing urse introduces the basins, as well a rivers and their flower transfer of materia dergy derived from de introduced and their groups species in field trip at they play in sustain of fresh waters, and trategies used to re	ng faster than the physicochemical is their seasonal odplains. Energy ils between water etrital inputs from functional roles and laboratory ning livelihoods is d the implications				
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 describe the global water cycle, the main sources and pathways of energy in freshwaters, and the influence of land-water interactions on aquatic productivity CLO 2 describe the composition of the freshwater biota (major groups) and their functional roles in aquatic ecosystems, and identify some of the common animals that occur in Hong Kong fresh waters						
	CLO 3 describe the results of modification of freshwater ecosystems by	humans, list the	main threats to				

			/ in Asia, explain why freshw egies used to reduce or mition	ater biota are vulnerable to human in	npacts, and indicate		
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in BIOL2102 and BIOL2306					
Offer in 2020 - 2021	N O	ffer in 2021 - 2022 : N		Examination			
Grade Descriptors (A+ to F)	A	Evidence of original log demonstrated by back analytical skills and/or	gical (or coherent) thought, strong kground reading and excellent us	analytical (or critical) abilities and a thorough ie of named (organism) examples. Show of vledge of general freshwater biodiveristy or so	excellent presentational,		
	В	subject as demonstrate	ed by background reading and use and knowledge of general freshwat	coherent) - but not necessarily original - think of named (organism) examples. Show good er biodiversity or selected taxa. Work more t	presentational, analytica		
	С	subject, but little or no Show fair presentation	evidence of original thinking, with	al (or coherert) thinking with an adequate (but limited background reading and use of nam- and some knowledge of general freshwater	ed (organism) examples		
	D	organizational, analytic	al or presentational skills. Shows in	tion of the subject (i.e. knowledge is very nsufficient evidence of background reading, o) or barely (D) adequate for what is required a	or familiarity with lab/field		
	Fail Evidence of poor or inadequate knowledge and understanding of the subject, and a lack of coherence, poor organization and/or excessive irrelevancy. Little or no evidence of familiarity with relevant reading material and lab/field techniques, or any knowledge of freshwater biodiversity. Work fails to reach degree level.						
Course Type	Lecture v	with laboratory compo	onent course				
Course Teaching	Activitie	es	Details		No. of Hours		
& Learning Activities	Lectures	3			26		
	Laboratory		project and laboratory and wetlands	project and laboratory work; field trips to local streams and wetlands			
	Reading	Reading / Self study					
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm	nents		30	CLO 2		
	Examina	ation		60	CLO 1,2,3		
	Laborato	ory reports		10	CLO 3		
Required/recommended reading and online materials	Allan, J.D. & Castillo, M.M. (2007). Stream Ecology. Springer. The Mekong River Awareness Kit (RAK) http://www.mrcmekong.org/RAK/html/rak_frameset.html An online training tool developed by an international team (including the course coordinator) that contains information on the physical and biological features of rivers, and shows how human livelihoods depend on river health. A list of references available in HKU library will be provided for each lecture on the course website.						
Course Website	http://mo	odle hku hk					
Course Website Additional Course		odle.hku.hk alternate year from 20	17-2018				

BIOL3314	Plant st	ructure and evolution (6 credits)		Academic Year	2020		
Offering Department		Sciences		Quota	30		
Course Co-ordinator	Prof R M	Prof R M K Saunders, Biological Sciences (saunders @hku.hk)					
Teachers Involved	(Prof R M K Saunders,Biological Sciences)						
Course Objectives		y the form and function of the vascuce of structures. This course forms a ba etics.					
Course Contents & Topics	explanati Information taxonomi water coi	The course will investigate various cell, tissue and organ types in the vascular plant body, with functional explanations for their diversity and discussions of the value of such knowledge in understanding plant phylogeny. Information on plant structure will be integrated with our current understanding of developmental genetics and taxonomic relationships derived from molecular phylogenetic research. Topics such as food storage, strength, water conduction, growth and development, pollination, fertilization, fruit and seed dispersal, germination, etc., will be discussed					
Course Learning	On succe	ssful completion of this course, students	should be able to:				
Outcomes	CLO 1 recognise the main plant cell types and explain how cells are integrated to form specific primary tissues (such as the xylem and phloem)						
	CLO 2 describe the developmental changes that occur in primary tissues with the onset of secondary growth						
	CLO 3 describe the structure, function and development of secondary vegetative structures (wood and bark)						
	CLO 4 integrate knowledge of the genetic control of floral development with the evolution of organ diversity						
	CLO 5 describe the structure of fruits from a functional perspective, and recognise how these structures are derived from the flower						
		xplain how seeds develop after fertilization patterns	on of the ovule, and how differ	ences in seed str	ucture influence		
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in BIOL1309; and Any level 2 BIOL course					
Offer in 2020 - 2021	N Of	er in 2021 - 2022 : Y		Examination			
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advance- learning outcomes, with evidence of extensive critical abilities and logical thinking. Apply highl draw appropriate and insightful conclusions.	packground reading and use of name	ed examples. Show e	vidence of significar		
	В	Demonstrate substantial command of knowledg some background reading and use of named e presentation skills. Demonstrate use of data and	xamples. Show evidence of critical a	bilities and logical thir			

	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the co- outcomes, with evidence of limited background reading and use of named examples. Show evidence of some critic logical thinking. Apply moderately effective presentation skills. Demonstrate mostly correct use of data and re appropriate and insightful conclusions. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learn					
	D	with insufficient evidence	of background reading a	edge and skills required for attaining some of the count use of named examples. Show evidence of lin Demonstrate limited ability to use data and results	nited critical abilities and		
	Fail	no evidence of background	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes, no evidence of background reading or use of named examples. Show little or no evidence of critical abilities and logical think Presentational skills are minimally effective or ineffective. Misuse of data and results to draw appropriate conclusions.				
Course Type	Lecture	with laboratory compone	nt course				
Course Teaching	Activiti	es	Details		No. of Hours		
& Learning Activities	Lectures						
	Laboratory			36			
	Reading / Self study				100		
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examin	ation		70	CLO 1,2,3,4,5,6		
	Laborat	ory reports		30	CLO 1,2,3,4,5,6		
Required/recommended reading and online materials	P.H. Ra	. Rudall: Anatomy of Flowering Plants, 3rd ed. Cambridge Univ. Press (2007) .H. Raven, R.F. Evert & S.E. Eichhorn: Biology of Plants, 7th ed. Freeman (2005) .list of additional reading material will be provided during the course.					
Course Website		oodle.hku.hk	•	,			
Additional Course Information		er in alternative year from 2018-2019 s course will be offered subject to a minimum enrollment number and availability of teachers.					

BIOL3318	Experim	nental intertidal ecology (6 credits)	Academic Yea	ar 2020		
Offering Department		I Sciences	Quota	20		
Course Co-ordinator	Prof G A	Williams, Biological Sciences (hrsbwga@hku.hk)	'			
Feachers Involved	(Prof G A	Williams, School of Biological Sciences)				
Course Objectives	them. The determinis	ine the communities of coastal systems: their distribu- nis course will examine, using an experimental approact stic and stochastic processes that create and sustain the arisons will be drawn from the coastlines of the world.	h, patterns exhibited by a rang	e of shores and the		
Course Contents & Topics	on them hydrologic animals examples manipulate herbivory	The first part of this course describes shores of the marine to brackish water continuum and the communities found on them. Lectures will cover the physical environment of the intertidal (e.g. tides; waves; geological and hydrological processes) the resultant variations in exposure and shore types and consequent distribution of animals and algae on these shores (vertical and horizontal zonation patterns) with specific Hong Kong examples. The second part of the course uses an experimental approach (e.g. sampling methodology; manipulative techniques; experimental design and data analysis) to investigate the factors (e.g. predation; herbivory; competition; disturbance; succession; patchiness and recruitment; supply side ecology) that structure these shores, with particular focus on rocky intertidal shores.				
Course Learning		essful completion of this course, students should be able	e to:			
Outcomes	CLO 1 describe the physical environmental factors (e.g., waves, tides) shaping the intertidal environment and how they interact with geographic features to produce different kinds of shores (e.g., sandy shores, mangroves) CLO 2 understand the factors limiting species distribution patterns on the vertical intertidal gradient and					
	appreciate methods to measure and investigate these patterns CLO 3 identify and quantify the distribution of a variety of local species on different Hong Kong shores					
	CLO 4 review, critique and design experimental studies to investigate patterns (e.g., zonation) and processes (e.g., herbivory, competition) in intertidal areas					
	CLO 5 explain the role of biological processes (e.g., predation, succession) and their interaction with the physical environment in shaping intertidal communities					
	eı	nvironment in shaping intertidal communities				
	CLO 6 pl	lan, design, execute, analyse and present a simple exp	erimental study on intertidal ec	ology		
and Co-requisites and Impermissible	CLO 6 pl	. *	erimental study on intertidal eco	ology		
(and Co-requisites and Impermissible combinations)	CLO 6 pl Pass in B	lan, design, execute, analyse and present a simple exp	erimental study on intertidal eco	ology		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	CLO 6 pl Pass in B	lan, design, execute, analyse and present a simple exp BIOL2102 or BIOL3301	Examination al and critical abilities and a thorough the dorganism) examples. Show e	May grasp of the subject as excellent presentational,		
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	CLO 6 pl Pass in B	lan, design, execute, analyse and present a simple exp siOL2102 or BiOL3301 d sem Offer in 2021 - 2022 : N Evidence of original, logical (or coherent) thought, strong analytic demonstrated by background reading and excellent use of nanalytical skills and/or lab/field skills, and demonstrate substa	Examination al and critical abilities and a thorough amed (organism) examples. Show e ntial knowledge of general intertidal nt), but not necessarily original, thinki ad (organism) examples. Show good p	May grasp of the subject as excellent presentational, ecology and excellent ng, a good grasp of the presentational, analytica		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	CLO 6 pl Pass in B	lan, design, execute, analyse and present a simple exp BIOL2102 or BIOL3301 d sem Offer in 2021 - 2022 : N Evidence of original, logical (or coherent) thought, strong analytic demonstrated by background reading and excellent use of no analytical skills and/or lab/field skills, and demonstrate substate experimental design and analysis skills. Evidence of analytical (or critical) abilities and logical (or cohere subject as demonstrated by background reading and use of name and/or lab/field skills, and demonstrate knowledge of general inter Evidence of some analytical (or critical) abilities and logical (or coisubject, but little or no evidence of original thinking, limited backg fair presentational, analytical and/or lab/field skills, and demon adequate abilities of experimental design and analysis.	Examination al and critical abilities and a thorough amed (organism) examples. Show e ntial knowledge of general intertidal ant), but not necessarily original, thinki d (organism) examples. Show good p idal ecology and good experimental de nerent) thinking with an adequate (but round reading and use of named (org strates some knowledge of general	May I grasp of the subject as xcellent presentational, ecology and excellent right and excellent right and excellent right and excellent right and analysical esign and analysis skills. Incomplete) grasp of the lanism) examples. Show intertidal ecology and		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	CLO 6 pl Pass in B Y 2nd A B C	lan, design, execute, analyse and present a simple exp BIOL2102 or BIOL3301 d sem Offer in 2021 - 2022 : N Evidence of original, logical (or coherent) thought, strong analytic demonstrated by background reading and excellent use of no analytical skills and/or lab/field skills, and demonstrate substate experimental design and analysis skills. Evidence of analytical (or critical) abilities and logical (or cohere subject as demonstrated by background reading and use of name and/or lab/field skills, and demonstrate knowledge of general inter Evidence of some analytical (or critical) abilities and logical (or coisubject, but little or no evidence of original thinking, limited backg fair presentational, analytical and/or lab/field skills, and demonal adequate abilities of experimental design and analysis. Evidence of retention of a minimum of relevant information of organizational, analytical or presentational skills. Show insufficiel techniques. Poor knowledge of general intertidal ecology and misi.	Examination al and critical abilities and a thorough amed (organism) examples. Show e thial knowledge of general intertidal ant), but not necessarily original, thinki ad (organism) examples. Show good p idal ecology and good experimental de iderent) thinking with an adequate (but round reading and use of named (org istrates some knowledge of general the subject (i.e. knowledge is very in at evidence of background reading on nderstanding of experimental design a	May I grasp of the subject as grasp of the subject as gracellent presentational, ecology and excellent ng, a good grasp of the presentational, analytical esign and analysis skills. Incomplete) grasp of the ganism) examples. Show intertidal ecology and necomplete), with limited r familiarity with lab/field and analysis.		
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and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	CLO 6 pl Pass in B Y 2nd A B C D Fail	lan, design, execute, analyse and present a simple exp BIOL2102 or BIOL3301 d sem Offer in 2021 - 2022 : N Evidence of original, logical (or coherent) thought, strong analytic demonstrated by background reading and excellent use of nalytical skills and/or lab/field skills, and demonstrate substate experimental design and analysis skills. Evidence of analytical (or critical) abilities and logical (or cohere subject as demonstrated by background reading and use of name and/or lab/field skills, and demonstrate knowledge of general inter Evidence of some analytical (or critical) abilities and logical (or coisubject, but little or no evidence of original thinking, limited backgair presentational, analytical and/or lab/field skills, and demonadequate abilities of experimental design and analysis. Evidence of retention of a minimum of relevant information of organizational, analytical or presentational skills. Show insufficient techniques. Poor knowledge of general intertidal ecology and miss Evidence of poor or inadequate knowledge and understanding of excessive irrelevancy. Limited or no evidence of familiarity with re	Examination al and critical abilities and a thorough amed (organism) examples. Show e ntial knowledge of general intertidal at), but not necessarily original, thinkied (organism) examples. Show good p idal ecology and good experimental de rerent) thinking with an adequate (but round reading and use of named (org istrates some knowledge of general the subject (i.e. knowledge is very in at evidence of background reading, or nderstanding of experimental design a the subject, and a lack of coherence, levant reading material and lab/field te	May I grasp of the subject as excellent presentational, ecology and excellent Ing, a good grasp of the presentational, analytica esign and analysis skills. incomplete) grasp of the panism) examples. Show intertidal ecology and incomplete), with limited r familiarity with lab/field and analysis. poor organization and/o		
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	CLO 6 pl Pass in B Y 2nd A B C D Fail	lan, design, execute, analyse and present a simple exp BIOL2102 or BIOL3301 d sem Offer in 2021 - 2022 : N Evidence of original, logical (or coherent) thought, strong analytic demonstrated by background reading and excellent use of nanalytical skills and/or lab/field skills, and demonstrate substa experimental design and analysis skills. Evidence of analytical (or critical) abilities and logical (or cohere subject as demonstrated by background reading and use of namand/or lab/field skills, and demonstrate knowledge of general inter Evidence of some analytical (or critical) abilities and logical (or coisubject, but little or no evidence of original thinking, limited backg fair presentational, analytical and/or lab/field skills, and demonadequate abilities of experimental design and analysis. Evidence of retention of a minimum of relevant information of organizational, analytical or presentational skills. Show insufficient techniques. Poor knowledge of general intertidal ecology and missus evidence of familiarity with references in the result of the properties of the properties of general intertidal ecology, and misuse of experimental design a with laboratory component course	Examination al and critical abilities and a thorough amed (organism) examples. Show e ntial knowledge of general intertidal at), but not necessarily original, thinkied (organism) examples. Show good p idal ecology and good experimental de rerent) thinking with an adequate (but round reading and use of named (org istrates some knowledge of general the subject (i.e. knowledge is very in at evidence of background reading, or nderstanding of experimental design a the subject, and a lack of coherence, levant reading material and lab/field te	May I grasp of the subject as excellent presentational, ecology and excellent Ing, a good grasp of the presentational, analytica esign and analysis skills. incomplete) grasp of the panism) examples. Show intertidal ecology and incomplete), with limited r familiarity with lab/field and analysis. poor organization and/o		
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	CLO 6 pl Pass in B Y 2nd A B C D Fail Lecture w	lan, design, execute, analyse and present a simple exp BIOL2102 or BIOL3301 d sem Offer in 2021 - 2022 : N Evidence of original, logical (or coherent) thought, strong analytic demonstrated by background reading and excellent use of nanalytical skills and/or lab/field skills, and demonstrate substa experimental design and analysis skills. Evidence of analytical (or critical) abilities and logical (or cohere subject as demonstrated by background reading and use of namand/or lab/field skills, and demonstrate knowledge of general inter Evidence of some analytical (or critical) abilities and logical (or coisubject, but little or no evidence of original thinking, limited backg fair presentational, analytical and/or lab/field skills, and demoi adequate abilities of experimental design and analysis. Evidence of retention of a minimum of relevant information of organizational, analytical or presentational skills. Show insufficiel techniques. Poor knowledge of general intertidal ecology and miss. Evidence of poor or inadequate knowledge and understanding of excessive irrelevancy. Limited or no evidence of familiarity with reof general intertidal ecology, and misuse of experimental design a vith laboratory component course Details	Examination al and critical abilities and a thorough amed (organism) examples. Show e ntial knowledge of general intertidal at), but not necessarily original, thinkied (organism) examples. Show good p idal ecology and good experimental de rerent) thinking with an adequate (but round reading and use of named (org istrates some knowledge of general the subject (i.e. knowledge is very in at evidence of background reading, or nderstanding of experimental design a the subject, and a lack of coherence, levant reading material and lab/field te	May a grasp of the subject as excellent presentational, ecology and excellent and a good grasp of the presentational, analytica esign and analysis skills incomplete) grasp of the anism) examples. Show intertidal ecology and incomplete), with limited and analysis. poor organization and/o echniques, or knowledge		
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	CLO 6 pl Pass in B Y 2nd A B C D Fail Lecture w Activities	lan, design, execute, analyse and present a simple exp BIOL2102 or BIOL3301 d sem Offer in 2021 - 2022 : N Evidence of original, logical (or coherent) thought, strong analytic demonstrated by background reading and excellent use of no analytical skills and/or lab/field skills, and demonstrate substate experimental design and analysis skills. Evidence of analytical (or critical) abilities and logical (or cohere subject as demonstrated by background reading and use of name and/or lab/field skills, and demonstrate knowledge of general inter Evidence of some analytical (or critical) abilities and logical (or cos subject, but little or no evidence of original thinking, limited backg fair presentational, analytical and/or lab/field skills, and demon adequate abilities of experimental design and analysis. Evidence of retention of a minimum of relevant information of organizational, analytical or presentational skills. Show insufficient techniques. Poor knowledge of general intertidal ecology and misus. Evidence of poor or inadequate knowledge and understanding of excessive irrelevancy. Limited or no evidence of familiarity with reof general intertidal ecology, and misuse of experimental design a with laboratory component course Details	Examination al and critical abilities and a thorough amed (organism) examples. Show e ntial knowledge of general intertidal at), but not necessarily original, thinkied (organism) examples. Show good p idal ecology and good experimental de rerent) thinking with an adequate (but round reading and use of named (org istrates some knowledge of general the subject (i.e. knowledge is very in at evidence of background reading, or nderstanding of experimental design a the subject, and a lack of coherence, levant reading material and lab/field te	May a grasp of the subject as excellent presentational, ecology and excellent and an excellent an		
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	CLO 6 pl Pass in B Y 2nd A B C D Fail Lecture w Activitie: Lectures	Idan, design, execute, analyse and present a simple exp BIOL2102 or BIOL3301 d sem Offer in 2021 - 2022 : N Evidence of original, logical (or coherent) thought, strong analytic demonstrated by background reading and excellent use of not analytical skills and/or lab/field skills, and demonstrate substate experimental design and analysis skills. Evidence of analytical (or critical) abilities and logical (or cohere subject as demonstrated by background reading and use of name and/or lab/field skills, and demonstrate knowledge of general inter Evidence of some analytical (or critical) abilities and logical (or costubject, but little or no evidence of original thinking, limited backg fair presentational, analytical and/or lab/field skills, and demon adequate abilities of experimental design and analysis. Evidence of retention of a minimum of relevant information of organizational, analytical or presentational skills. Show insufficient techniques. Poor knowledge of general intertidal ecology and miss. Evidence of poor or inadequate knowledge and understanding of excessive irrelevancy. Limited or no evidence of familiarity with reof general intertidal ecology, and misuse of experimental design a with laboratory component course S Details	Examination al and critical abilities and a thorough amed (organism) examples. Show e ntial knowledge of general intertidal at), but not necessarily original, thinkied (organism) examples. Show good p idal ecology and good experimental de rerent) thinking with an adequate (but round reading and use of named (org istrates some knowledge of general the subject (i.e. knowledge is very in at evidence of background reading, or nderstanding of experimental design a the subject, and a lack of coherence, levant reading material and lab/field te	May a grasp of the subject as excellent presentational, ecology and excellent ng, a good grasp of the presentational, analytica esign and analysis skills. incomplete) grasp of the panism) examples. Show intertidal ecology and necomplete), with limited remailiarity with lab/field and analysis. poor organization and/occhniques, or knowledge. No. of Hours 16		
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	CLO 6 pl Pass in B Y 2nd A B C D Fail Lecture w Activitie: Lectures Field wor	lan, design, execute, analyse and present a simple exp BIOL2102 or BIOL3301 d sem Offer in 2021 - 2022 : N Evidence of original, logical (or coherent) thought, strong analytic demonstrated by background reading and excellent use of nanalytical skills and/or lab/field skills, and demonstrate substa experimental design and analysis skills. Evidence of analytical (or critical) abilities and logical (or cohere subject as demonstrated by background reading and use of namand/or lab/field skills, and demonstrate knowledge of general inter Evidence of some analytical (or critical) abilities and logical (or cosubject, but little or no evidence of original thinking, limited backg fair presentational, analytical and/or lab/field skills, and demon adequate abilities of experimental design and analysis. Evidence of retention of a minimum of relevant information of organizational, analytical or presentational skills. Show insufficient techniques. Poor knowledge of general intertidal ecology and miss. Evidence of poor or inadequate knowledge and understanding of excessive irrelevancy. Limited or no evidence of familiarity with reof general intertidal ecology, and misuse of experimental design a vith laboratory component course S Details	Examination al and critical abilities and a thorough amed (organism) examples. Show e ntial knowledge of general intertidal at), but not necessarily original, thinkied (organism) examples. Show good p idal ecology and good experimental de rerent) thinking with an adequate (but round reading and use of named (org istrates some knowledge of general the subject (i.e. knowledge is very in at evidence of background reading, or nderstanding of experimental design a the subject, and a lack of coherence, levant reading material and lab/field te	May a grasp of the subject a excellent presentational ecology and excellent ng, a good grasp of thoresentational, analytica esign and analysis skills incomplete) grasp of the lanism) examples. Show intertidal ecology and incomplete, with limited framiliarity with lab/field and analysis. Proor organization and/cechniques, or knowledg No. of Hours 16 28		

Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments	continual assessment	60	CLO 1,2,3,4,5,6
	Examination		40	CLO 1,2,3,4,5
Required/recommended reading and online materials		hore Ecology of Hong Kong (Hong ridge, C.D.: The Biology of Rocky \$		
Course Website	http://moodle.hku.hk			
Additional Course	Offer in alternate year from 2017-2	2018		
Information	This course will be offered subject	to a minimum enrollment number a	and availability of teachers	S.

nard,Biological Science motivated students to be focuses on the ecological scale. Students will in shaping current biological component on the major process ecosystems and their report of the component of the c	es (bguenard@hku.hk) les) to acquire the knowledge and skill logy of terrestrial habitats providing all learn about the evolution of clim diversity and ecosystems distributionsition of organisms within terre leses regulating communities. An ir mechanisms is provided. Finally, the ples in Hong Kong is provided. course will introduce students to be let, collecting and analysing their owner. Particular emphasis will be give ciently. Attendance and participation thinking on chosen topics in terroresentation, a final term paper and course, students should be able to f biodiversity patterns and shapin time scales leatterns that sustain biodiversity in the leats the study of terrestrial biodiversity an active learner through the problem	an overview of patterns and ate and topography over gon. The course also focuse strial ecosystems of Tropintroduction to several globale study of habitats recover asic field techniques used in data involving both field an on how to efficiently reacon in class are encourage estrial ecology. Assessme a final examination covering processes within terrest their pristine form and distured some of the methods to examination of the methods to examination of the methods to examination of the methods to examination.	oblems in terrestrial processes at global geological times and geological times and geological times and geological threats only through ecological in ecology. Students and laboratory worked and write scientified through series of the includes probleming the content of the trial ecosystems at the bed state			
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Information

Course Co-ordinator Teachers Involved Course Objectives Rew other groups of animals have captured the public's imagination the way marine mammals, especial and dolphins have. This course covers the evolutionary biology, ecology, behaviour, and conservation mammals: whales, objectives Course Contents 8 Topics The course begins with an overview of mammals appeals and warluses (principed), mammals lie in the evolutionary biology, ecology, behaviour, and conservation to mammals: whales, objective and the property of property of the prop	BIOL3320		logy of marine mam	mais (6 credits)	Academic Yea		
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		nicci, Biological Sciences	. ,				
Teachers Involved		inicci,Biological Sciences	•		. 0		
Course Objectives	introduced marine inv benthic ar	This course introduces the students to the diversity, biology and ecology of marine invertebrates. Students will be introduced to various aspects of the systematics, anatomy, physiology and functional ecology of the major phyla of marine invertebrates to appreciate the diversity of body plans and ecological roles these animals play in costal, benthic and pelagic ecosystems. The course will particularly focus on the South East Asian seas, which are the most diverse marine systems in the world.					
Course Contents			all animal species. While insects	dominate the terrestrial	landscapes, marine		
& Topics	environme worms), C the seas. of all mar relatives. This cour- structure relationshi pathways, students v of the fund	This course will lead the students through the discovery of the amazing variety of body plans, adaptations, structure and function of marine invertebrates. In the first part of the course, the study of the phylogenetic relationships and the body plans of marine invertebrates groups, together with the associated evolutionary pathways, will be described to provide students with an evolutionary grand tour of life on Earth. In the second part, students will learn the mechanisms underpinning the ecological functions of marine ecosystems, through the study of the functional biology and ecology of the dominant groups. The diversity of invertebrates present in South East Asian seas will be introduced, and students will become familiar the commonest Hong Kong taxa and species in					
Course Learning		•	course, students should be able to:				
Outcomes		entify major taxa of mari					
			history of the different taxa, under	standing their relationships			
	to	identify common specie	of the invertebrates communities a es and taxa typical of Hong Kong co biology of marine invertebrates an	oastal waters			
		arine ecosystems	blology of marine invertebrates an	id their contribution to cook	ogical functioning o		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Bl	•					
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : Y		Examination			
Grade Descriptors (A+ to F)	Α	A Evidence of a thorough grasp of the subject and relevant research techniques. Eagerness and enthusiasm to learn and excellent familiarity with relevant background reading and case studies. Exemplary handling of field data collection and excellent askills. Ample evidence of independent critical thought with excellent use of a broad range of fundamental concepts and broader comparative perspective to draw insightful and logical conclusions. Show outstanding abilities of independent work, effective presentation skills with excellent analytical argumentation. Excellent or outstanding work relative to what is required at degree level.					
	С	with relevant background reading and case studies. Good handling of field data collection and commendable analytical skills. Good evidence of critical thought (although not always independent), with an appreciable use of fundamental concepts and consideration of broader comparative perspective in drawing logical conclusions. Good abilities of independent work, effective presentation skills with logical and analytical argumentation. Work more than sufficient for what is required at degree level.					
		Demonstrate some grasp of the subject, but only partial and with limited understanding of relevant research concepts an research techniques. Some familiarity with relevant case studies, but insufficient evidence of background reading and limite abilities of critical independent thinking. Ineffective presentation skills with generally weak logical argumentation with restricte ability of drawing appropriate conclusions. Work barely meets what is required at degree level. No evidence of basic a minimum grasp of the subject and the minimum relevant research techniques. No evidence of					
	D	abilities of critical independe ability of drawing appropriate	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is re	t insufficient evidence of backgro with generally weak logical argu equired at degree level.	research concepts and ound reading and limited mentation with restricted		
	Fail	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective presenta reach degree level.	familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is r ninimum grasp of the subject and the m o familiarity with any relevant examples ar ation skills with poor argumentation and n	t insufficient evidence of backgrowith generally weak logical arguequired at degree level. ninimum relevant research techid case studies. Inadequate evidit	research concepts and und reading and limited mentation with restricted iniques. No evidence of ence of coherent logical mentation in the coherent logical research in the coherent logical research in the coherent logical research coherent logical research in the coherent logical research coherent logica		
	Fail Lecture wi	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective presente reach degree level. ith laboratory componen	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is re ninimum grasp of the subject and the mo familiarity with any relevant examples ar ation skills with poor argumentation and not tourse	t insufficient evidence of backgrowith generally weak logical arguequired at degree level. ninimum relevant research techid case studies. Inadequate evidit	research concepts and bund reading and limited mentation with restricted niques. No evidence of lence of coherent logica onclusions. Work fails to		
Course Teaching	Fail Lecture wi	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective presente reach degree level. ith laboratory componen	familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is r ninimum grasp of the subject and the m o familiarity with any relevant examples ar ation skills with poor argumentation and n	t insufficient evidence of backgrowith generally weak logical arguequired at degree level. ninimum relevant research techid case studies. Inadequate evidit	research concepts and bund reading and limited mentation with restricted iniques. No evidence of lence of coherent logical proclusions. Work fails to the No. of Hours		
Course Teaching	Fail Lecture wi Activities Lectures	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective presenta reach degree level. ith laboratory componen	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is re ninimum grasp of the subject and the mo familiarity with any relevant examples ar ation skills with poor argumentation and not tourse	t insufficient evidence of backgrowith generally weak logical arguequired at degree level. ninimum relevant research techid case studies. Inadequate evidit	research concepts and limited mentation with restricted iniques. No evidence of lence of coherent logical proclusions. Work fails to the conclusions of the conclusions and the conclusions are conclusions.		
Course Teaching	Fail Lecture wi Activities Lectures Laborator	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective presenta reach degree level. ith laboratory componen	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is re ninimum grasp of the subject and the mo familiarity with any relevant examples ar ation skills with poor argumentation and not tourse	t insufficient evidence of backgrowith generally weak logical arguequired at degree level. ninimum relevant research techid case studies. Inadequate evidit	research concepts and pund reading and limited mentation with restricted iniques. No evidence of ence of coherent logical conclusions. Work fails to the concept of the con		
Course Teaching	Fail Lecture wi Activities Lectures	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective presenta reach degree level. ith laboratory componen s	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is re ninimum grasp of the subject and the mo familiarity with any relevant examples ar ation skills with poor argumentation and not tourse	t insufficient evidence of backgrowith generally weak logical arguequired at degree level. ninimum relevant research techid case studies. Inadequate evidit	research concepts and limited mentation with restricted iniques. No evidence of lence of coherent logical proclusions. Work fails to the conclusions of the conclusions and the conclusions are conclusions.		
Course Teaching	Fail Lecture wi Activities Lectures Laborator Field worl Project wi	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective presenta reach degree level. ith laboratory componen s	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is re ninimum grasp of the subject and the mo familiarity with any relevant examples ar ation skills with poor argumentation and not tourse	t insufficient evidence of backgrowith generally weak logical arguequired at degree level. ninimum relevant research techid case studies. Inadequate evidit	research concepts and pund reading and limited mentation with restricted iniques. No evidence of ence of coherent logical proclusions. Work fails to the conclusions of the conclusions and the conclusions are conclusions.		
Course Teaching & Learning Activities	Fail Lecture wi Activities Lectures Laborator Field worl Project wi	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective presenta reach degree level. ith laboratory componen s	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is re ninimum grasp of the subject and the mo familiarity with any relevant examples ar ation skills with poor argumentation and not tourse	t insufficient evidence of backgrowith generally weak logical arguequired at degree level. ninimum relevant research techid case studies. Inadequate evidit	research concepts and sund reading and limited mentation with restricted miques. No evidence of ence of coherent logical proclusions. Work fails to the conclusions of the conclusions o		
Course Teaching & Learning Activities Assessment Methods	Fail Lecture with Activities Lectures Laborator Field world Project with Reading / Methods	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective presenta reach degree level. ith laboratory componen s	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is rininimum grasp of the subject and the monoton familiarity with any relevant examples are action skills with poor argumentation and mult course Details	t insufficient evidence of backgrowith generally weak logical arguequired at degree level. ninimum relevant research technological evidence as studies. Inadequate evidio abilities to draw meaningful companies to descript the description of the degree of	research concepts and bund reading and limited mentation with restricted miques. No evidence of ence of coherent logical conclusions. Work fails to the second seco		
Course Teaching Learning Activities Assessment Methods	Fail Lecture with Activities Lectures Laborator Field worth Project with Reading / Methods Assignment	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective present reach degree level. ith laboratory componen is series of the control of t	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is rininimum grasp of the subject and the monoton familiarity with any relevant examples are action skills with poor argumentation and mult course Details	t insufficient evidence of backgrowith generally weak logical arguequired at degree level. ninimum relevant research technological evidence and case studies. Inadequate evidio abilities to draw meaningful companies to describe the described case studies and the degree of the degre	research concepts and bund reading and limited mentation with restricted iniques. No evidence of ence of coherent logical conclusions. Work fails to the conclusions of the conclusions		
Course Teaching Learning Activities Assessment Methods	Fail Lecture with Activities Lectures Laborator Field world Project with Reading / Methods Assignment Examinat	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective present reach degree level. ith laboratory componen is series of the control of t	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is rininimum grasp of the subject and the monoton familiarity with any relevant examples are action skills with poor argumentation and mult course Details	t insufficient evidence of backgrowith generally weak logical arguequired at degree level. ninimum relevant research technological evidence as studies. Inadequate evidio abilities to draw meaningful companies to descript the description of the degree of	research concepts and pund reading and limited mentation with restricted iniques. No evidence of ence of coherent logical conclusions. Work fails to the second sec		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended	Fail Lecture wind Activities Lectures	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective present reach degree level. ith laboratory componens Ty k ork / Self study ents icion ry reports arnes, Peter P. Calow, Fetebrates: A Synthesis, 3r Edward E.; Fox, Richard mont, CA: Thomas-Brool	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is rininimum grasp of the subject and the molamiliarity with any relevant examples are ation skills with poor argumentation and not course Details Details	t insufficient evidence of backgrowith generally weak logical arguequired at degree level. Ininimum relevant research technological services argued to the second of the	research concepts and pund reading and limited mentation with restricted miques. No evidence of ence of coherent logical conclusions. Work fails to the second management of the second management o		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Fail Lecture with Activities Lectures Laborator Field world Project with Reading / Methods Assignment Examinat Laborator In R. S. K. B. The Invert Ruppert, E 2004. Belr Students with Activities In Students with Activities In The Invertigation of the Invertiga	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective presentareach degree level. ith laboratory components Ty k ork / Self study ents ion ry reports armes, Peter P. Calow, Febrates: A Synthesis, 3r Edward E.; Fox, Richard mont, CA: Thomas-Brool will be directed to releval	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is rainimum grasp of the subject and the monotonial familiarity with any relevant examples are attion skills with poor argumentation and not course Details Details	t insufficient evidence of backgrowith generally weak logical arguequired at degree level. Ininimum relevant research technological services argued to the second of the	research concepts and pund reading and limited mentation with restricted miques. No evidence of ence of coherent logical conclusions. Work fails to the second management of the second management o		
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials Course Website Additional Course	Fail Lecture with Activities Lectures Laborator Field worth Project with Reading / Methods Assignment Examinat Laborator In R. S. K. B. The Inverting Ruppert, E. 2004. Bell Students with http://moo.	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective presentareach degree level. ith laboratory components Ty k ork / Self study ents cition ry reports earnes, Peter P. Calow, Fetebrates: A Synthesis, 3r Edward E.; Fox, Richard mont, CA: Thomas-Brool will be directed to relevated entities.	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is rininimum grasp of the subject and the molamiliarity with any relevant examples ar ation skills with poor argumentation and not course Details t insufficient evidence of backgrowith generally weak logical arguequired at degree level. Ininimum relevant research technological services argued to the second of the	research concepts and pund reading and limited mentation with restricted miques. No evidence of ence of coherent logical conclusions. Work fails to the second management of the second management o			
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and conline materials Course Website	Fail Lecture with Activities Lectures Laborator Field worth Reading / Methods Assignment Examinat Laborator Ruppert, Electures Ruppert, Electudents with the Students with t	abilities of critical independe ability of drawing appropriate No evidence of basic a m background reading and no thought; ineffective presente reach degree level. ith laboratory components Ty k ork / Self study ents cion ry reports armes, Peter P. Calow, F tebrates: A Synthesis, 3r Edward E.; Fox, Richard mont, CA: Thomas-Brool will be directed to relevated le.hku.hk ternate year from 2017-2	e familiarity with relevant case studies, but ent thinking. Ineffective presentation skills e conclusions. Work barely meets what is rininimum grasp of the subject and the molamiliarity with any relevant examples ar ation skills with poor argumentation and not course Details tinsufficient evidence of backgrowith generally weak logical arguequired at degree level. ninimum relevant research technid case studies. Inadequate evidio abilities to draw meaningful control of the course grade (%) Weighting in final course grade (%) 30 50 20 Spicer. 2001 22 Zoology: A Functional Events	research concepts amound reading and limited mentation with restricted iniques. No evidence of ence of coherent logical conclusions. Work fails to the conclusions of			

Offering Department	Biological	Sciences		Quota	10		
Course Co-ordinator	Prof. G.A.	Williams, Biological Scient	ences (hrsbwga@hku.hk)				
Teachers Involved	(Prof. G.A	. Williams, School of Biol	ogical sciences)				
Course Objectives	relevant e communiti This will b	Ising a comparative approach between Hong Kong and South African shores, students will learn to identify the elevant environmental gradients which define the intertidal zone, and the species interactions which mould these ommunities. This will be achieved through an intensive field-based approach, visiting and working in different intertidal habitats in both Hong Kong and, during a residential fieldcamp, in South Africa.					
Course Contents & Topics	Students v residential (1) Intertid (2) Specie (3) Specie (4) Trophio (5) Larger- HKU Stud South Afric reports on	Students will learn the abiotic and biotic factors that structure intertidal communities in Hong Kong and, during a esidential fieldcamp, different South African intertidal communities. In South Africa, specific topics will focus on 1) Intertidal biodiversity and species interactions 2) Species distribution patterns on intertidal shores 3) Species interactions and behaviour 4) Trophic interactions and connectivity between local terrestrial and marine communities. 5) Larger-scale connectivity from freshwaters to marine systems 1KU Students will work in groups with students from the University of Johannesburg and North West University, South Africa to collect data; design and carry out experiments; present their findings; and write up formal scientific eports on the different topics.					
Course Learning			in different years and are weather				
Outcomes	CLO 1 co Pr CLO 2 ide CLO 3 un dis CLO 4 de CLO 5 int CLO 6 an	In successful completion of this course, students should be able to: CLO 1 compare the contrast the shallow water coastal environments of Hong Kong and the Eastern Cape Province of South Africa CLO 2 identify a range of species and their roles and relationships in the intertidal zone CLO 3 understand the abiotic conditions defining the intertidal environment and quantify and interpret the distribution of species over relevant environmental gradients CLO 4 design, execute and analyse experiments to investigate species interactions CLO 5 integrate abiotic and biotic interactions to determine patterns of connectivity between intertidal habitats CLO 6 analyse, interpret and present data using a variety of media to demonstrate scientific understanding of					
Pre-requisites and Co-requisites and Impermissible combinations)		oics OL2306 or BIOL3301					
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : Y		Examination			
(A+ to F)	B C D	of data and results to draw a and critical abilities and logical thraw appropriate conclusions. Conclusional draw appropriate conclusions. Conclusional draw appropriate conclusions. Conclusional and critical abilities and techniques. Limite and and presentational skills. Cock of analytical and critical abilities of data and results and/or una	hinking. Competent lab / Good organizational and ogical thinking. Adequate appropriate conclusions. and logical thinking, but ad ability to use data and ies, logical and coherent				
Course Type	Field camp		anization and poor presentational skills.				
Course Teaching			Detaile		No of Hours		
& Learning Activities	Activities	•	Details Pro course modules		No. of Hours		
- Louining Activities	Field work	,	Pre-course modules	60			
	Tutorials	`	Pre-course assignments	10			
		Self study	i io-course assignments		50		
Assessment Methods and Weighting	Methods	Sell study	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	nts	Group presentation 30		CLO 3,4,5,6		
	Report		60		CLO 1,2,3,4,5,6		
	Test		Pre-course 10 CLO 1,2,6				
Required/recommended reading and contine materials	Students v	vill be directed to relevar	nt scientific literature, websites and	d appropriate teaching mat	erials.		
Course Website	http://moo	dle.hku.hk					
Additional Course Information	Students of South Africa second Rocontribute costs may	p://moodle.hku.hk udents who have taken BIOL3318 will be at an advantage. udents will join undergraduate students from the University of Johannesburg and North Western University, uth Africa on a residential field camp at Tsitsikamma (Storms River Camp, Eastern Province, South Africa) in the cond Reading Week (Second Semester). Students will be expected to live in tented accommodation and ntribute to daily camp activities as well as conduct fieldwork in potentially harsh environmental conditions. Extra sts may be involved in the course, which may include airfares. Accommodation, meal costs and internal travel in uth Africa are covered by South African hosts.					

BIOL3401	Molecular biology (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	130
Course Co-ordinator	Dr K W Y Yuen, Biological Sciences (kwyyuen@hku.hk)		
Teachers Involved	(Dr C B Chan,Biological Sciences) (Dr K W Y Yuen,Biological Sciences) (Dr Y L Zhai,Biological Sciences)		
Course Objectives	To provide students with recent knowledge in molecular biology with spec structure and function at the molecular level.	ial emphasis on th	ne study of gene
Course Contents	The course includes a detailed account of the molecular processes in eukary	otic and prokaryoti	c cells, from DNA

& Topics	replication, RNA transcription, protein translation, to post-translational modifications with special emphasis on the regulation of prokaryotic and eukaryotic gene expression. Recently developed biochemical techniques including oligonucleotide synthesis, DNA sequencing, complementary screening and DNA cloning, site-directed						
Course Learning		mutagenesis, polymerase chain reaction and transgenic technology will also be discussed. On successful completion of this course, students should be able to:					
Outcomes	CLO 1 kr	•	of DNA, RNA and protein, and how	v DNA is package in the n	ucleus of eukaryotic		
			cal processes involved in DNA re in prokaryotes and eukaryotes	eplication, transcription, t	ranslation and post-		
	CLO 3 ex	cplain and describe the re	egulation of gene transcription in p	rokaryotes and eukaryotes	3		
			nd understanding of the underlying , site-directed mutagenesis, DNA s		recently developed		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	IOC2600 or BIOL2103 or	r BIOL2220 or MEDE2301 or BME	D2301			
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20)22 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	A	outcomes. Show strong ana knowledge to a wide range of	tery at an advanced level of extensive k lytical and critical abilities and logical think of complex, familiar and unfamiliar situation lraw appropriate and insightful conclusions	ing, with evidence of original the s. Apply highly effective lab skill	bught, and ability to apply s and techniques. Critical		
	В	Demonstrate substantial command of a broad range of knowledge required for attaining at least most of the course learnin outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar an some unfamiliar situations. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilitities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problem Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropria conclusions. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture w	ith laboratory componen	t course				
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures			24			
	Laborato	ry			20		
	Tutorials				6		
	Reading	/ Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	assessment of practical work	20	CLO 1,2,4		
	Examinat	tion		80	CLO 1,2,3,4		
Required/recommended reading and online materials	J. Watson B. Lewin:	R. Weaver: Molecular Biology (McGraw-Hill, 2005 or 2008) I. Watson et al.: Molecular Biology of the Gene (Benjamin Cummings, 2004) B. Lewin: Gene IX (Jones and Bertlett, 2008) Gelected journal articles and web learning materials.					
Course Website	_	odle.hku.hk/					

BIOL3402	Cell biology and cell technology (6 credits)	Academic Year	2020		
Offering Department	Biological Sciences	Quota	120		
Course Co-ordinator	Prof A S T Wong, Biological Sciences (awong1@hku.hk)	'			
Teachers Involved	(Dr W Y Lui,Biological Sciences) (Prof A S T Wong,Biological Sciences) (Prof. M L Chye,Biological Sciences)				
Course Objectives	To provide a coherent understanding of the structure and function of cell cell culture and instrumentation in biology and biotechnology	s, and the principles ar	nd applications of		
Course Contents & Topics	I. Cell Biology Cell membranes. Organelles. Cellular transport: ions transport and ions Membrane potentials, Action potentials. Cell junctions. Extracellular Minteractions. II. Techniques in animal cell culture Mammalian cells in culture. Primary and continuous cell lines. Cell typ formulation, growth factors and design of serum-free media. Culture lab cryopreservation. III. Techniques in plant cell culture Root and shoot cultures. Explant regeneration. Protoplasts. Secondary me	latrix. Cell-cell interact les and cell growth pa facilities and sterilizatio	ions. Cell-matrix		
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 acquire fundamental knowledge on cell biology and cell technology CLO 2 demonstrate basic laboratory techniques on cell culture CLO 3 gain insight into real-life applications in cell biology and cell technology				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOC2600 or BIOL2103 or BIOL2220 or MEDE2301				

Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20	022 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to appl knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational skills. Writing consistently demonstrate informed, thoughtful intellectual engagement with broad range of relevant concepts.					
	В	Demonstrate substantial command of a broad range of knowledge required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational skills. Writings mostly demonstrate informed, thoughtful intellectual engagement with broad range of relevant concepts.					
	С	Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations Apply moderately effective organizational skills. Writings mostly indicate informed, intellectual engagement with concepts or theories but not always with sufficient depth, breadth or understanding.					
	D	Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational skills. Writings indicate some intellectual engagement with concepts or theories but mostly at a superficial level.					
	Fail	Demonstrate little or no evidence of command of knowledge required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organizational skills are minimally effective or ineffective. Writings reveal an absence of intellectual engagement with concepts or theories. Writings are irrelevant or superficial.					
Course Type	Lecture w	ith laboratory componen	t course				
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures				24		
	Laboratory				24		
	Tutorials				12		
	Reading / Self study				100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examinat	ion		50	CLO 1,3		
	Laborato	ry reports		30	CLO 2,3		
	Test	•		20	CLO 1		
Required/recommended	Textbooks	S:		·			
reading and	Alberts, B	. et al.: Molecular Biolog	y of the Cell (Garland, 2	2014, 6th ed.)			
online materials	Mather, J. P.: Introduction to Cell and Tissue Culture, Theory and Techniques (Plenum, 1998) Collins, H.A. & Edwards, G.S.: Plant Cell Culture (Oxford: Bios Scientific, 1998) References:						
	TBC						
Course Website	http://moc	dle.hku.hk/					

BIOL3403	lmmun	ology (6 credits)		Academic Year	2020			
Offering Department		al Sciences		Quota	90			
Course Co-ordinator	Dr Chao	Dr Chaogu Zheng, Biological Sciences (cgzheng@hku.hk)						
Teachers Involved	(Dr W B	ogu Zheng,Biological L Lim,Biological Scie	ences) '					
Course Objectives	immune		nding of the animal immune system with a thogens. Topics will also include the appl nosis.					
Course Contents & Topics	antibodie Humoral presenta bacteria, tests and	Cells and organs in the immune systems and their functions in vertebrates. Structures and biological properties of antibodies. Generation of diverse antibodies through somatic recombination. Innate and adaptive immunity. Humoral and cell-mediated immunity. T-cell receptor signalling. Major histocompatibility complex and antigen presentation. Emergence and characteristics of lymphoid tissues. Complement pathways. Immunity against bacteria, viruses and parasites. AIDS, COVID-19, Vaccination, hypersensitivity, and autoimmunity. Immunological tests and immunochemical techniques using antibodies and their application to various biological problems in research and clinic.						
Course Learning	On succe	essful completion of	this course, students should be able to:					
Outcomes	CLO 1 describe the structure and function of the immune molecules which are involved in the body defense mechanisms, including antibody, T-cell receptor, cytokines, MHC and complement proteins							
	CLO 2 describe the organization of the mammalian immune system in terms of genes, cells and tissues							
	CLO 3 explain the underlying mechanisms associated with transplant rejection, transfusion reaction and vaccination							
	CLO 4 explain how the immune system responds to infections by bacteria, viruses and parasites							
	CLO 5 understand antigen-antibody interaction and the principle of immunoassays							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	BIOC2600 or BIOL21	103 or BIOL2220 or MEDE2301 or BMED	2301				
Offer in 2020 - 2021	Y 2r	nd sem Offer in 202	21 - 2022 : Y	Examination	May			
Grade Descriptors (A+ to F)	A 1. Exceptionally good performance demonstrating comprehensive understanding of the subject matter. 2. Critical insight and analysis into the scientific literatures. 3. Superior writing, presentation and group communication skills.							
,	B 1. Good performance demonstrating full understanding of the subject matter. 2. Coherent insight and analysis into the scientific literatures. 3. Good writing, presentation and group communication skills.							
	 Satisfactory performance demonstrating adequate understanding of the subject matter. 2. Some insight into the scientific literatures. 3. Adequate writing and communication skills. 							
	 Limited performance demonstrating some understanding of basic subject matter. 2. Some ability to use the scientific literatures. 3.Limited writing and communication skills. 							
	Fail 1. Poor understanding of subject matter. 2. Little to no insight into use of the scientific literatures. 3. Unable to write o communicate.							
Course Type	Lecture v	with laboratory comp	onent course					
Course Teaching	Activitie	es	Details		No. of Hours			
& Learning Activities	Lectures	8			30			
	Laborate		during reading week		16			
	Tutorials	3			6			

	Reading / Self study			100			
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Examination		60	CLO 1,2,3,4,5			
	Laboratory reports		20	CLO 1,2,3,4,5			
	Test	Mid term	20	CLO 1,2,3,4,5			
Required/recommended reading and online materials	Benjamin & Leskowitz: Immunol	. Kuby: Immunology (Freeman and Company, 2003 or 2007-6thd ed., or 2013-7th ed.) Benjamin & Leskowitz: Immunology: A Short Course (Wiley-Liss, 2007, 6th edition. Or the latest edition) Roitt, J. Brostoff and D. Male: Immunology (Mosby, latest 2 editions)					
Course Website	http://moodle.hku.hk/		·				
Additional Course Information	This course will be offered subject to a minimum enrollment number and availability of teachers.						

BIOL3405	Molecula	ar microbiology (6 credits)	Aca	ademic Yea	r 2020	
Offering Department	Biological		<u> </u>	Que	ota	30	
Course Co-ordinator	, Biologi	cal Sciences ()		·			
Teachers Involved	(,Biologi	cal Sciences)					
Course Objectives	modern fu physiologic	nis course is intended for biology, biotechnology and biochemistry students who would like to understand the odern fundamentals of microbiology. At the end of the course the students are expected to know the sysiological, biochemical and molecular aspects of microbiology.					
Course Contents	The basic	biochemistry of micro	porganisms will be described	. The intrinsic factors tha	it affect the o	growth of microbe	
& Topics	changes a considered aspect will	he environment will be examined. The adaptation of the microbes to the environment by means of physiological inges and genetical alterations will be illustrated. The molecular biology of bacteria and viruses will be isidered. The molecular biology of plasmids and transposable elements and their association with medical lect will be discussed. The use of modern technology in studying microorganisms will be explored.					
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 understand the intrinsic reorganization of microbes in response to the changing environments						
Gatcomes	CLO 2 comprehend the major modes of regulation in the microbe						
			bacteriophages and plasmids				
					hoc		
			of transposable elements in				
			oment of modern techniques	in studying microorganis	1115		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Bl	OL2103					
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : N		Exa	amination		
Grade Descriptors (A+ to F)	A	learning outcomes. Dem with evidence of original	mastery at an advanced level of ex nonstrate thorough grasp of the subj al thought. Apply highly effective la al conclusions. Apply highly effective	ect. Show strong analytical ar b skills and techniques. Criti	nd critical abilitie cal use of data	es and logical thinking	
	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Demonstrate substantial grasp of the subject. Show evidence of analytical and critical abilities and logica thinking. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.						
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.						
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcome Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack analytical and critical abilities, logical and coherent thinking. Apply minimally effective or ineffective lab skills and technique Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimal effective or ineffective.					se learning outcomes. nce of little or lack of skills and techniques	
Course Type	Lecture wi	th laboratory compor	nent course				
Course Teaching	Activities		Details			No. of Hours	
& Learning Activities	Lectures					24	
	Laborator	у				20	
	Tutorials					6	
	Reading /	Self study				100	
Assessment Methods and Weighting	Methods	,	Details	Weighting course gra		Assessment Methods to CLO Mapping	
	Examination			70		CLO 1,2,3,4	
	Laboratory reports			20		CLO 3,4,5	
	Presentation 10					CLO 1,2,5	
Required/recommended reading and online materials	TBC Maloy S.R Willey, She Watson, B						
Course Website				- ,			
Additional Course		//moodle.hku.hk/ course will be offered subject to a minimum enrollment number and availability of teachers.					

BIOL3406	Reproduction and reproductive biotechnology (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	50
Course Co-ordinator	Prof A O L Wong, Biological Sciences (olwong@hku.hk)		

Teachers Involved	(Prof A O	L Wong,Biological Scie	nces)			
Course Objectives			verview on modern concepts and	recent advances in repr	roductive biology &	
Course Contents & Topics	reproductive biotechnology in human and animal models. -Basic concepts of reproduction, evolution of sex, human & animal reproductive strategies and sexual behavior. -Molecular mechanisms for sex determination, developmental aspects of gametogenesis and reproductive systems. -Neuroendocrinology of reproductive system and recent advances in kisspeptin & GnRH system and steroid feedback via KNDy neuronal circuit. -Environmental endocrine disruptors and recent advances in biotechnology for fertility control & assisted reproduction in human. -Recent advances in embryonic stem cells & induced pluripotent stem cells and their applications in regenerative medicine/therapeutic cloning. -New technology for genome editing by TALENT & CRISPR/Cas9 systems and gene therapy, animal cloning and primordial germ cell transplantation in animal models.					
Course Learning		· .	course, students should be able to:			
Outcomes	CLO 1 Have a broad understanding of reproductive biology ranging from evolution of sex, different reproductive strategies & sexual behaviors in animals to the regulatory mechanisms for sex determination & development of reproductive systems.					
	rep	• •	f the recent advances on neuroer al behavior, parental care, and pre	•		
	ро	ssible causes of huma	ing on the adverse effects of enviro n infertility & treatment with assisted ge of modern technologies for geno	reproduction.		
	ce		the applications of embryonic s			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BI	OL2103 or BIOL2220 o	or BIOC2600 or MEDE2301			
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2	022 : Y	Examination	Dec	
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.					
	B Demonstrate substantial command of a broad range of knowledge required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	C Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	Demonstrate partial but limited command of knowledge required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.					
Course Type		th laboratory componer	T=			
Course Teaching & Learning Activities	Activities Details Lectures		No. of Hours 24			
Louining Addivides	Laboratory			24		
	Tutorials		6			
	Reading / Self study				100	
			Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Methods				to CLO Mapping	
	Methods Examinati	ion		70	CLO 1,2,3,4	
	Examinati Laborator			15	CLO 1,2,3,4 CLO 2,3,4	
and Weighting	Examinati Laborator Test	y reports	Test & Continuous Assessment	15 15	CLO 1,2,3,4 CLO 2,3,4 CLO 1,2,3,4	
Assessment Methods and Weighting Required/recommended reading and online materials	Examinati Laborator Test 1. Biotech Science P 2. Human (Winner of 3. Reprodu	y reports nology of Animal Repro ublishers (2016). Reproductive Biology f 2015 Textbook Excelle uction System at a Glar	oduction (e-book) by M. M. Seneda (4th edition, e-Book) by R.E. Jone ence Award). nce by L.J. Heffner & D.J. Schust, V	15 15 , K. C. Silva-Santos & L. S s & Kristin H. Lopez, Aca Viley-Blackwell (2014).	CLO 1,2,3,4 CLO 2,3,4 CLO 1,2,3,4 6. R. Martinho, Nova demic Press (2015)	
and Weighting Required/recommended reading and online materials	Examinati Laborator Test 1. Biotech Science P 2. Human (Winner of 3. Reprodu 4. Yen and	y reports nology of Animal Repro ublishers (2016). Reproductive Biology f 2015 Textbook Excelle uction System at a Glar d Jaffe Reproductive Er	oduction (e-book) by M. M. Seneda (4th edition, e-Book) by R.E. Jone ence Award).	15 15 , K. C. Silva-Santos & L. S s & Kristin H. Lopez, Aca Viley-Blackwell (2014).	CLO 1,2,3,4 CLO 2,3,4 CLO 1,2,3,4 6. R. Martinho, Nova demic Press (2015)	
and Weighting Required/recommended reading and	Examinati Laborator Test 1. Biotech Science P 2. Human (Winner of 3. Reprodu 4. Yen and http://mood	y reports nology of Animal Repro ublishers (2016). Reproductive Biology f 2015 Textbook Excelle uction System at a Glar	oduction (e-book) by M. M. Seneda (4th edition, e-Book) by R.E. Jone ence Award). nce by L.J. Heffner & D.J. Schust, V ndocrinology (e-Book) by J.F. Straus	15 15 , K. C. Silva-Santos & L. S s & Kristin H. Lopez, Aca Viley-Blackwell (2014).	CLO 1,2,3,4 CLO 2,3,4 CLO 1,2,3,4 6. R. Martinho, Nova demic Press (2015)	

BIOL3408	Genetics (6 credits)	Academic Year	2020	
Offering Department	Biological Sciences	Quota	50	
Course Co-ordinator	Dr G Y W Chan, Biological Sciences (gywchan@hku.hk)			
Teachers Involved	(Dr C Schunter,Biological Sciences) (Dr G Y W Chan,Biological Science)			
Course Objectives	This course aims to provide students with fundamental knowledge of classical, molecular and population genetics			
Course Contents & Topics	Topics will include cellular reproduction, principles and chromosomal basis of M and mapping, concept and definition of the gene, molecular mechanisms recombination, DNA transposition, extranuclear inheritance, developmental genetics. Students are strongly encouraged to take BIOL2303 Molecular Biolecoverage of topics in molecular genetics.	s of mutation, [netics, quantitativ	ONA repair and e and population	

Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 appreciate the beauty of genetic organizations in nature					
	CLO 2 ι	use different genetic prir	nciples to explain hereditary traits obs	erved in nature and labora	atories	
	CLO 3 apply qualitative and quantitative experimental methodologies for genetic analysis at individual and population levels					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOL1110; and BIOL2102 or BIOL2103					
Offer in 2020 - 2021	Y 1s	st sem Offer in 2021 -	2022 : Y	Examination	Dec	
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Integration of the full range of appropriate theories, principles, evidence and techniques					
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. General integration of theories, principles, evidence and techniques					
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Some partial integration of theories, principles, evidence and techniques					
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Limited integration of theories, principles, evidence and techniques					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Little or no or inapt integration of theories, principles, evidence and techniques					
Course Type	Lecture	with laboratory compone	ent course			
Course Teaching	Activitie	es	Details		No. of Hours	
& Learning Activities	Lectures				24	
	Laboratory				24	
	Tutorials		tutorials & laboratories		6	
	Reading / Self study				100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignments		laboratory reports, assignments	50	CLO 1,2,3	
	Examination			50	CLO 1,2,3	
Course Website	http://moodle.hku.hk/					
Additional Course Information	This course will be offered subject to a minimum enrollment number and availability of teachers.					

BIOL3409	Busine	ss aspects of biotechnology (6 credits)	Academic Year	2020	
Offering Department	Biologica	al Sciences	Quota	40	
Course Co-ordinator	Dr W B I	Lim, Biological Sciences (bllim@hku.hk)			
Teachers Involved	(Dr K W Y Yuen,School of Biological Sciences) (Dr Ng,Guest Lecture) (Dr W B L Lim,Biological Science)				
Course Objectives	The course will give an overview of the innovative developments in biotech industry and provide the students with useful tools in learning how an exciting research idea can be turned into a viable business.				
Course Contents	The purpose of the course is to introduce you to the entrepreneurial process with a focus on the biotechnology				
& Topics	industry. The course will provide a thoughtful, practical guide to the process of successfully launching an entrepreneurial venture. We place a special emphasis on the decision to become a biotech entrepreneur and how to develop successful business ideas, however we will also discuss the process of moving from an idea to a biotech firm. Topics on intellectual properties, patent laws, patent application process, licensing and fundraising wil be covered as well. Throughout the course, guest entrepreneurs, managers and directors of the biotech industry will be presenting case studies and explain their involvement in various biotech and pharmaceutical companies. Topics: 1. Introduction to Biotechnology Industry: 4 P in Biotechnology Business (3 hours) 2. IP rights: Patent application, Patent system, USPTO, SIPO, PCT (6 hours) 3. Licensing of IP rights (3 hours) 4. Technology Transfer Office and HKSTP (3 hours) 5. How to raise fund for startup companies (3 hours)? 6. Agrobiotechnology and Green Tech (Monsanto, Novozymes, etc) (4.5 hours) 7. Drug development and clinical trials (Gilead Sciences, Wuxi PharmaTech, etc). (6 hours) 8. Diagnostics business (BGI, Diagcor, etc) (4.5 hours) 9. Company analysis (3 hours) 10. Company Visit 11. Company analysis				
Course Learning Outcomes		essful completion of this course, students should be able to			
	CLO 1 understand and demonstrate knowledge of the development and management of biotechnology business				
	CLO 2 understand and demonstrate how discoveries and inventions are commercialized				
	CLO 3 navigate the various steps in the development of a biotechnology derived product: from bench, to scale-up, to market				
	CLO 4 gain technical and business knowledge of the biotechnology and bioprocessing industries				
	CLO 5 participate and contribute to the business side of scientific enterprises				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in any level 3 BIOL or BIOC or BBMS course; NOT for students who have passed in BIOL2409. This course is only for students admitted in 2017-2018 or before.				
Offer in 2020 - 2021	N O	ffer in 2021 - 2022 : N	Examination		
Grade Descriptors (A+ to F)	A	Students acquire exceptional skills and knowledge from the course a technological developments of various biotechnology ventures.		ring the business and	
(0.)	В	Students demonstrate a broad and in-depth understanding of the	current developments in biotechnolo	gy industry and are	

		capable of analyzing the bu	siness and technological dev	elopments of various biotechnology ventures ur	nder guidance.
	С	Students demonstrate a bro	oad and in-depth understandi	ng of the current developments in biotechnology	industry.
	D	Students demonstrate a mo	derate understanding of the	current developments in biotechnology industry.	
	Fail	Students fail to demonstrate	e a moderate understanding	of the current developments in biotechnology inc	dustry.
Course Type	Lecture-	-based course			
Course Teaching	Activiti	es	Details		No. of Hours
& Learning Activities	Lecture	S			36
	Field w	ork			6
	Group v	work	Presentation		12
	Readin	g / Self study			60
	Assess	ment	Assignment		18
Assessment Methods and Weighting	Method	ds	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignr	nents		60	CLO 1,2,3,4,5
	Presen	tation		20	CLO 1,2,3,4,5
	Test			20	CLO 1,2,3,4,5
Required/recommended reading and online materials	McGraw Compar	, ,	f, Andrew J. Nelson (20	011) Technology Ventures: From Idea	to Enterprise 3rd ed.
Course Website	http://me	oodle.hku.hk/			
Additional Course Information		urse will be offered subject will be given to students m		ent number and availability of teachers MBB	S.

BIOL3419	Insect	ecology: the little t	hings that run the world (6 credits)	Academic Year	2020
Offering Department		al Sciences	, , , , , , , , , , , , , , , , , , , ,	Quota	25
Course Co-ordinator	Dr B Gu	enard, Biological Scien	ces (bguenard@hku.hk)		
Teachers Involved	(Dr B Gı	uenard,School of Biolog	ical Siences)		
Course Objectives	arachnic ecology	ds, students will be into to understand the fund	dents with the biology of terrestrial arthropods. troduced to various aspects of their anatomy alamental roles that arthropods play in natural and the diversity and importance of insects in South	and physiology, d human-shaped	systematics, and
Course Contents & Topics	all speci ecologic agents, and fund profit of discover imaginal This cou deserve present diversity impacts problem	ies known on the planed cal interactions played predators, parasitoids, ctioning of most ecosys f larger "charismatic" ries, revealing sometimition, and challenging expurse will propose an interaction to the stutch the main criteria to record of human activities on is or solution they representations.	000 species described respectively, insects and . A diversity also reflected in the diversity of beha at all trophic levels within ecosystems. As hert disease vectors or decomposers, arthropods are tems. Yet their importance is often underestimat vertebrates. However, arthropods offer increase attributes in morphology, reproduction or busting paradigms in ecology and evolution. troduction to these extremely successful organis dy of arthropods is to learn how to identify then cognize major insects and arachnids groups. Tigical functions within ecosystems. Finally the las arthropods, how they have been used historicall sent for human societies?	aviours, evolution pivores, pollinato e major compone ed by many field edible opportunit ehaviour beyond sms and give the n correctly. Part the second part to part of the cour	ary adaptations ors, seed-dispersal ents in the stability sof biology to the ies for scientifical the most prolification the value they of this course will will focus on theis will present the
Course Learning	On succ	essful completion of thi	s course, students should be able to:		
Outcomes	CLO 1	identify major groups of	insects and arthropods		
	CLO 2	understand and use the	e main collecting methods to sample arthropod di	versity	
	CLO 3	understand the ecologic	cal diversity of arthropod groups and their importa	ance in ecosyste	ms
	CLO 4	understand the biotic ar	nd abiotic factors that drive terrestrial arthropod s	pecies richness	and abundance
	CLO 5	understand how humar	activities modify insect diversity		
	CLO 6	describe the multiple ro	les played by insects on human activities		
Pre-requisites and Co-requisites and Impermissible combinations)		BIOL1309 and BIOL230			
Offer in 2020 - 2021		st sem Offer in 2021 -		Examination	Dec
Grade Descriptors (A+ to F)	В	identification skills and u attitude in class. Curatio course.	sellent understanding of the biological concepts and theories se of taxonomic keys of the different groups of arthropods so n and identification of the collection reaching international supplies that the property and theories developed to the property and theories developed to the property and theories developed to the property and theories developed to the property and theories developed to the property and theories developed to the property and theories developed to the property and theories developed to the property and theories developed to the property and	studied. Present an a scientific standard as	ctive and participative presented during the
	identification skills and use of taxonomic keys of the different groups of arthropods. Participation in class more limited. Curation and identification of the collection satisfactory for the course.				
	С	Identification skills and u Participation in class very	se of taxonomic keys of the different groups of arthropods i γ limited or irrelevant. Curation and identification of the collect	nsufficient to provide	reliable identification demic level.
	D	and use of taxonomic ke unsettling. Poor curation	d understanding of the biological concepts and theories deve eys of the different groups of arthropods inadequate and mo and identification of the collection.	stly inaccurate. No p	articipation in class of
	Fail	skills and lack of knowle	of knowledge on the biological concepts and theories deve dge on how to use taxonomic keys. No participation in class ork not delivered on time.		
Course Type	Lecture	with laboratory compon	ent course		
Course Teaching	Activiti	es	Details		No. of Hours
Learning Activities	Lecture	S			24
	Laborat	ory	This part includes 4 hours of lectures about and curation of arthropod collection.		28
	Project	work	Students will collect independently their collection, curate and identify the specimen of		48

	Reading / Self study			50
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		30	CLO 1,2,3,5,6
	Examination		40	CLO 1,2,3,4,5,6
	Laboratory reports		30	CLO 1,2,3
Required/recommended reading and	Price et al. 2011. Insect Ecology: USA. 801 pages.	,	ŭ	ity Press, New York,
online materials	Schowalter T. D. 2011. Insect Eco	logy, an ecosystem approach. E	lsevier, China. 633 pages.	
Course Website	http://moodle.hku.hk			
Additional Course	Offer in alternate year from 2017-2	018		
Information	This course will be offered subject	to a minimum enrollment number	er and availability of teachers	3

BIOL3501	Evoluti	ion (6 credits)		Academic Y	ear 2020	
Offering Department		al Sciences		Quota	50	
Course Co-ordinator	Dr M Su	n, Biological Science	ces (meisun@hku.hk)			
Teachers Involved						
Course Objectives	contemp adaptation	oorary evolutionary on, speciation, and rse emphasizes the	y biology, including the histor evolution as an explanatory fran e interplay between theory and ε	rse aims to introduce students to ry of evolutionary biology, evolu- nework at all levels of biological orgon empirical tests of hypotheses, thus	utionary processes, ganization.	
Course Contents		process of science tion to Evolution				
& Topics Course Learning	- The rel Cases - Evolutior - Pattern - The evi Evolutior - Before - Darwin - The Mc The Mc - The ori - Genetic - Natural - Migratic Evolutior - Specie: - Specie: - Specie: - The his - Evtolutior - Estimat	levance of evolution for evolutionary thin as Fact as of evolutionary clidence for evolution as Theory Darwin ism odern Synthesis & Ichanisms of Evolution at I selection, sexual son and Biodiversity stion and developmentary of life ting Evolutionary T	nking hange n beyond on stion: mutation random. selection, and adaptation. nt	e able to:		
Course Learning Outcomes	CLO 1 f CLO 2 d I CLO 3 f	On successful completion of this course, students should be able to: CLO 1 familiar with the facts and theory of evolution CLO 2 describe Darwin's theory of evolution by natural selection and how the process of natural selectic lead to speciation CLO 3 have an advanced understanding of the modern evolutionary theory CLO 4 apply evolutionary thinking to real world problems in agriculture, medicine, and biodiversity conserva				
Pre-requisites (and Co-requisites and Impermissible	Pass in E	BIOL2306				
combinations)						
Offer in 2020 - 2021		offer in 2021 - 2022		Examination		
Grade Descriptors (A+ to F)	B C D	range of topics conshowing strong ability to handle the learning outcomes. Adequate performa but showing incomp Minimally acceptable relatively simple procurse learning out Poor performance	vered by the course, and skillful applic illities in critical thinking and logical rea ical issues in the field. demonstrating capacity to use the appro- te problems and materials encountered ince demonstrating some understanding plete command of knowledge required for le performance demonstrating at least pa- oblems, but also demonstrating serious comes. in all aspects of the course, showing li	inderstanding of the subject matter, extensistations of concepts/theories in solving new isoning, with evidence of significant insight opriate concepts, a good understanding of the subject, showing evidence of attain of the subject matter, an ability to handle reattaining most of the expected course lear artial familiarity with the subject matter and adeficiencies in knowledge required for attainitite evidence of learning, lacking real und interest the subject matter and adeficiencies of learning, lacking real und ittel evidence of learning, lacking real und its evidence of learning.	v or unfamiliar problems, and original thought in the subject matter, and ar- ining most of the course elatively simple problems ning outcomes. some capacity to deal with ning most of the expected lerstanding of the subject	
-			ing deficiencies serious enough to make	it inadvisable to proceed further without add	ditional course work.	
Course Type		based course	Deteile		No of U	
Course Teaching & Learning Activities	Activitie Lectures Tutorials Project	s s	Details		No. of Hours 36 12 12 100	
Assessment Methods and Weighting	Method	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignm	nents		10	CLO 1,2,3,4	
	Essay			5	CLO 1,2,3,4 CLO 1,2,3,4	

	Presentation		10	CLO 1,2,3,4
	Project reports	including computer lab	15	CLO 1,2,3,4
	Test		10	CLO 1,2,3,4
Required/recommende reading and online materials		: Evolutionary Analysis (5th ed. Pearsc on, (3rd Edition, Sinauer Associates, 2		
Course Website	http://moodle.hku.hk/			
Additional Course Information	This course will be offered so	ubject to a minimum enrollment numbe	er and availability of teach	ers.

BIOL3502	Conserv	ation genetics (6 cr	redits)	Academic Yea	r 2020
Offering Department	Biological		,	Quota	50
Course Co-ordinator		Biological Sciences (me	eisun@hku.hk)		1-1-
eachers Involved	2 •,	Zielegiea: eelelieee (iii	order Grinding		
Course Objectives	The theori	ies and methods will s, fish, invertebrates, as	be taught with a balance	nciples and recent advances in cored range of examples - mamma trate how genetic data can be used	ıls, birds, reptiles,
Course Contents & Topics	Part I. Evo - genetic d - character - evolution - genetic c - maintena - populatio Part II. Effe - loss of ge - inbreedin - populatio - genetical Part III. Fro - resolving - genetic m	In to conservation genet dutionary Genetics of Nativersity is genetic diversity: seary impacts of natural seary impacts of natural search genetic diversity. In genomics. The cets of Population Size of the search genetic diversity in small genetic diversity in sma	atural Populations: single loci and quantitative velection, mutation, migration oppulation sizes; Reduction: populations; s and defining management ulations;	n and their interactions in large pop	oulations;
Course Learning	genetic isgenetic mgenetic muse of mo	sues in introduced and nanagement of captive p nanagement for reintrod olecular genetics in fore	invasive species; copulations;		
Outcomes	CLO 2 unspired spired s	derstand the criteria for ecies ow the methods for cha mprehend the relationsl tential in wild populatior scribe the effects of ha olications in managing r in ability to integrate ge	r determining the conserval racterizing genetic diversity hips between genetic divers as abitat fragmentation and po- nature reserves enetic information in resolvir	epts of conservation genetics tion status of endangered, vulneral at population and species levels sity, inbreeding, reproductive fitnes epulation size reduction on genetic ing taxonomic uncertainties, in und reloping management strategies for	s, and evolutionary c diversity and the erstanding species
Pre-requisites and Co-requisites and Impermissible combinations)		OL2306 or BIOL3303 or	r BIOL3408		
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : N		Examination	
Grade Descriptors (A+ to F)	Exceptionally good performance demonstrating excellent understanding of the subject matter, e range of topics covered by the course, and skillful applications of concepts/theories in solvi showing strong abilities in critical thinking and logical reasoning, with evidence of significant dealing with the critical issues in the field. Good performance demonstrating capacity to use the appropriate concepts, a good understand ability to handle the problems and materials encountered in the subject, showing evidence		ions of concepts/theories in solving new oning, with evidence of significant insight riate concepts, a good understanding of the	or unfamiliar problems, and original thought in subject matter, and ar	
	learning outcomes. C Adequate performance demonstrating some understanding of the subject matter, an ability to handle relability showing incomplete command of knowledge required for attaining most of the expected course learning			ng outcomes.	
	D Minimally acceptable performance demonstrating at least partial familiarity with the subject matter and some capacity to deal with relatively simple problems, but also demonstrating serious deficiencies in knowledge required for attaining most of the expected course learning outcomes. Fail Poor performance in all aspects of the course, showing little evidence of learning, lacking real understanding of the subject				
_				nadvisable to proceed further without additi	onal course work.
Course Type Course Teaching	Activities	th laboratory componen	t course Details		No. of Hours
Learning Activities	Lectures				24
	Laboratory				12
	Project wo	ork			12
	Tutorials				12
	Reading /	Self study			100
Assessment Methods	Reading / Methods	Self study	Details	Weighting in final	100 Assessment

and Weighting			course grade (%)	Methods to CLO Mapping
	Assignments		10	CLO 1,3,4,5,6
	Essay		5	CLO 1,2,3,4,5
	Examination		50	CLO 1,4,5,6
	Laboratory reports		10	CLO 3
	Presentation		10	CLO 1,4,5,6
	Project report		5	CLO 1,4,6
	Test		10	CLO 1,4,5,6
Required/recommended reading and online materials	Frankham et al: Introduction to Con e-book available	servation Genetics (Cambridge Uni	versity Press, 2009, 2nd	d ed.)
Course Website	http://moodle.hku.hk/			
Additional Course	Website - to be listed			
Information	This course will be offered subject t	o a minimum enrollment number ar	d availability of teachers	3.

BIOL3503	Endocri	nology: human	physiology II (6 credits)	Academic Yea	ar 2020
Offering Department	Biological			Quota	60
Course Co-ordinator	Dr C B Ch	an, Biological Scie	nces (chancb@hku.hk)		
Teachers Involved	(Dr Y L Zh	nan,Biological Scie ai,Biological Scien	ces)		
		C Chow, Biological	,		
Course Objectives		e an advanced con homeostasis in our	ourse on hormones and how they body.	regulate metabolism/growth	, reproduction an
Course Contents & Topics	signaling. The hypoti The GHRI Catechola The gastro The enter Regulation GIP, CCK, Insulin and Reproduct The GnRI Interaction testosteror cycle: horr regulation Osmoregu Posterior	Secondary messer halamic pituitary and H-GH-IGF axis. The mine effects and the pintestinal system in of acid secretion, secretion, secretin, GLP-1, of glucagon. Gluca	e TRH-TSH-thyroid hormone axis. The cir pathways. n. The cephalic phase, stomach place Regulation of pancreatic exocrine and BLP-2 and motilin. Regulation of feeding the common of the	ne CRH-ACTH-cortisol axis. The CRH-ACTH-cortisol axis. The and intestinal phase and endocrine secretion. Gut are secretion. Gut and FSH release. Male represulate spermatogenesis. Provelopment of ovarian follion of the placenta as an endocrinal and broodiness.	of food digestion hormones: gastriil intake. productive system Biological actions cles. The menstruate organ. Endocrin
			eptide and its function in water and so		
Course Learning		•	this course, students should be able to	D:	
Outcomes			tion and natures of hormones		
		•	secondary messenger pathways for h		
			on between pituitary the master gland		
		•	hormones involved in the regulation		functions including
			eproduction and water/salt homeostas	sis	
Pre-requisites (and Co-requisites and Impermissible	Pass in BI	OL2103			
combinations)					
Offer in 2020 - 2021	Y 2nd	sem Offer in 202	21 - 2022 : Y	Examination	May
Grade Descriptors	Α	Demonstrate thoroug	h mastery at an advanced level of extensive	knowledge required for attaining	
(A+ to F)	В	knowledge to a wide r Demonstrate substan outcomes. Show evid some unfamiliar situat	ng analytical and critical abilities and logical thi ange of complex, familiar and unfamiliar situatic tial command of a broad range of knowledge ence of analytical and critical abilities and logi ions. Apply effective organizational skills. but incomplete command of knowledge require	ons. Apply highly effective organizat required for attaining at least mos ical thinking, and ability to apply kn	onal skills. t of the course learnin owledge to familiar ar
	С				
	evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational skills.				
	D		out limited command of knowledge required for herent and logical thinking, but with limited a		
			oblems. Apply limited or barely effective organiz		minited ability to app
	Fail	Demonstrate little or analytical and critical	no evidence of command of knowledge requabilities, logical and coherent thinking. Show we re minimally effective or ineffective.	uired for attaining the course learn	
Course Type	Lecture wi	th laboratory comp	•		
Course Teaching	Activities		Details		No. of Hours
Learning Activities	Lectures	•	Details		24
Learning Activities		.,	a 5-hour laboratory session per	wook for E wooks	25
	Laborator	у	a 5-nour laboratory session per	week for 5 weeks	
	Tutorials	Solf study			6 100
		Self study	Deteile	\A/a i a b i i f i	
1			Details	Weighting in final course grade (%)	Assessment Methods
Assessment Methods and Weighting	Methods			554155 g. 445 (75)	
		ion			to CLO Mappin
	Methods Examinati Laborator		lab performance & report	80 20	

online materials	
Course Website	http://moodle.hku.hk/
Additional Course Information	This course will be offered subject to a minimum enrollment number and availability of teachers.

Course Co-ordinator Teachers Involved Course Objectives Introduct Provide Enable restorati Underst Facilitate Course Contents & Topics This ex advance oyster a endeave coastal pertainir will learn oyster he (Malays sustaina only HK culture, discusse larval bit Course Learning Outcomes Course Learning Outcomes CLO 1 CLO 2 CLO 3 CLO 4 Pre-requisites (and Co-requisites and Impermissible combinations)	students to design, construction of wild oysters; and the reasons for restoration e transfer of academic knowled periential learning course is the coastal aquaculture product aquaculture facilities for food or encompassing larval hatcher aquaculture, we will focus or ing to coastal aquaculture will a my oyster habitat is declining the learning opportunities. Students will be exposial to learn practical skills of oable aquaculture in Hong Kong U but also teachers from Univand learning opportunities. Carella the composition of this course examine the influence of enviropotential effects of these variate acquire skills and experiential in oyster hatchery and farming explain the importance of oyste plan and execute a commercial BIOL2103 or BIOL2306 or BIO. Store in 2021 - 2022: N Evidence of original thought of multidimensional thinking about the outcomes. Demonstrate excellent project data. Show highly effective Show substantial knowledge and analytical, critical and multidimensions. Demonstrate excellent project data. Show highly effective Show substantial knowledge and analytical, critical and multidimensions. Demonstrate excellent project data. Show highly effective Show substantial knowledge and analytical, critical and multidimensions. Demonstrate excellent project data. Show highly effective Show substantial knowledge and analytical, critical and multidimensions. Demonstrate excellent project data. Show highly effective Show substantial knowledge and analytical, critical and multidimensions. Demonstrate excellent project data. Show highly effective Show substantial knowledge and analytical, critical and multidimensions. Demonstrate excellent project data. Show highly effective Show substantial knowledge and analytical, critical and multidimensions. Demonstrate excellent project data. Show highly effective Show substantial knowledge and analytical, critical and multidimensions. Demonstrate excellent project data. Show highly effective show substantial knowledge and analytical, critical and multidimensions.	technology; Jaculture through field demonstration and maintain larval hatchery for an of marine, estuarine and coastal adge to aquaculture for sustainable to enhance students' knowledge tion systems that will enable them production and restoration of wifery technology and aquaculture. After the hatchery technology and aquaculture also be covered using oyster farming in HK and would also explore so seed to few aquaculture facilities if oyster farming. This course is design. Students will be exposed to a system of the students of the stud	production of seeds for ecosystems; food production. in applied larval biolog to design, construct, opild population. This is a feer reading about basic culture. Environmental ng in Hong Kong as an escientific and manageme in Hong Kong & will be signed to meet the need unique learning environinging with them diverse reportunities in aquaculturitical capabilities for a station are proportunities in account and sellis required for attaining the class room to critically and ip skills. Examination Examination Examination account of the class room to critically and ip skills. If existing the class room to critically and ip skills. If existing the class room to critically and ip skills. If existing the class room to critically and ip skills. If existing the class room to critically and ip skills required for attaining the class room to critically and ip skills.	r aquaculture and recommendation interdisciplina oyster biology a issues, legislatic example. Studer example. Studer to Penar sof an expandiment involving mange of expertisure industry will luccessful career atories and farm all the course learning all the course learning all the course learning all the revidence of son red for attaining all to interdisciplinary and the course learning all the course learning all the revidence of son red for attaining all the results and the course learning all the revidence of son red for attaining all the results and the revidence of son red for attaining all the results are resulted as a supplication of the results are re	
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CLO 2 CLO 3 CLO 4 Pre-requisites and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) B C D Fail Course Type Field ca	potential effects of these varials acquire skills and experiential I in oyster hatchery and farming explain the importance of oyster plan and execute a commercial BIOL2103 or BIOL2306 or BIODL2103 or BIODL2306 or BIODL23	bles on hatchery and farming learning opportunities (e.g. hands-g) ler farming in coastal habitat restorally important research project in la DL3301 or BIOL3303 during the analysis of larval biology is the study subject. Extensive knowledge an it ability to apply what you have learned in the organizational, presentational and field trid thought during the analysis of marine inscional thinking about the study subject. Goonstrate good ability to apply what you have	examination Exami	atories and farm	
Pre-requisites and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 N C Grade Descriptors (A+ to F) B C Course Type Field ca	BIOL2103 or BIOL2306 or BIO Differ in 2021 - 2022: N Evidence of original thought d multidimensional thinking about ti outcomes. Demonstrate excellent project data. Show highly effective Show substantial knowledge and analytical, critical and multidimens course learning outcomes. Demo real marine life science issues. Sh Show general but incomplete kno	during the analysis of larval biology is the study subject. Extensive knowledge an the ability to apply what you have learned in ve organizational, presentational and field trid thought during the analysis of marine Insional thinking about the study subject. Goonstrate good ability to apply what you hav	Examination sues. Show evidence of an and skills required for attaining the class room to critically and ip skills. If e science issues. Show so bood knowledge and skills require learned in the class room to	nalytical, critical ar all the course learni alyze the larval biolo me evidence of son red for attaining all t	
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 N C Grade Descriptors (A+ to F) B C D Fail Course Type Field ca	Differ in 2021 - 2022: N Evidence of original thought d multidimensional thinking about the outcomes. Demonstrate excellent project data. Show highly effective Show substantial knowledge and analytical, critical and multidimens course learning outcomes. Demo real marine life science issues. Show general but incomplete known or the strength of the science issues. Show general but incomplete known or the strength of the strength of the science issues. Show general but incomplete known or the strength of th	during the analysis of larval biology is the study subject. Extensive knowledge an it ability to apply what you have learned in re organizational, presentational and field tri id thought during the analysis of marine l insional thinking about the study subject. Go onstrate good ability to apply what you hav	sues. Show evidence of an d skills required for attaining the class room to critically and ip skills. life science issues. Show so bood knowledge and skills requi we learned in the class room t	all the course learni alyze the larval biolo me evidence of son red for attaining all t	
Grade Descriptors (A+ to F) B C D Fail Course Type Field ca	Evidence of original thought d multidimensional thinking about the outcomes. Demonstrate excellent project data. Show highly effective Show substantial knowledge and analytical, critical and multidimens course learning outcomes. Demo real marine life science issues. Show general but incomplete known or the complete known or the	the study subject. Extensive knowledge an nt ability to apply what you have learned in re organizational, presentational and field tri dd thought during the analysis of marine I insional thinking about the study subject. Go onstrate good ability to apply what you have	sues. Show evidence of an d skills required for attaining the class room to critically and ip skills. life science issues. Show so bood knowledge and skills requi we learned in the class room t	all the course learni alyze the larval biolo me evidence of son red for attaining all t	
(A+ to F) B C D Fail Course Type Field ca	multidimensional thinking about the outcomes. Demonstrate excellent project data. Show highly effective Show substantial knowledge and analytical, critical and multidimens course learning outcomes. Demo real marine life science issues. Show general but incomplete known or the complete show the complete show the complete show the complete show the control of the complete show the control of the complete show the control of the complete show the control of the complete show the control of the contr	the study subject. Extensive knowledge an nt ability to apply what you have learned in re organizational, presentational and field tri dd thought during the analysis of marine I insional thinking about the study subject. Go onstrate good ability to apply what you have	nd skills required for attaining the class room to critically and ip skills. life science issues. Show sor and knowledge and skills requive learned in the class room t	all the course learni alyze the larval biolo me evidence of son red for attaining all t	
Fail Course Type Field ca		owledge and original thought during the ar all the course learning outcomes. Demonstrate real marine life science issues. Show cor	nalysis of marine life science i rate fair ability to apply what y	ssues. Fair knowled ou have learned in t	
Course Type Field ca	skills. Evidence to show a minimum knowledge (i.e. knowledge is very incomplete) and thought during the analysis of marine life science issues. Show insufficient knowledge and skills required for attaining all the course learning outcomes. Demonstrate poor ability to apply what you have learned in the class room to critically analyze the real marine life science issues. Show very little organizational, presentational and field trip skills.				
	Evidence of meager or inadequate and skills required for attaining al class room to critically analyze the	d fleid trip skills. Ite knowledge and understanding of marine all the course learning outcomes. Demonst ne real marine life science issues. Show no any knowledge of organizational and preser	rate no ability to apply what you evidence of familiarity with rel	ou have learned in t	
Course Teaching Activiti	mps				
		etails		No. of Hours	
Lecture				25	
Field wo				25	
	ory work			25	
Tutorial				10 5	
Present	g / Self study			20	
Assessi				10	
Assessment Methods Method		etails	Waighting in first		
nd Weighting	is Det	etaiis	Weighting in final course grade (%)	Assessmen Methods to CLO Mapping	
Assignr	nents		25	CLO 3,4	
Report	ide: ecc	esentation: developing innovative eas for sustainable and onomically viable aquacultre in ong Kong	50	CLO 4	
Test	1101	ing Kong	25	CLO 1,2	
Required/recommended Ecology reading and Shellfish online materials Mollusca	1101	ong Kong	20		

Course Website	http://www.biosch.hku.hk/ecology/lsc/
Additional Course	Taught and trained by several teachers, guest lecturers from government and aquaculture business sector;
Information	This course is offered in close collaboration with USM (Penang, Malaysia);
	Tentative duration: 1-15 June, 2016;
	In Part 1 - First 5 days at HKU for lectures, practicals and field visits - then flight to Penang to visit various oyster
	aquaculture facilities;
	Few USM (Malaysia) students may join the course;
	Fund for the Penang visit will be collected from students (about 6000 HKD including airfare, accommodation and
	selective meals for 7 days).
	This course will be offered subject to a minimum enrollment number and availability of teachers.
	This course will be offered in alternative year.

BIOL3506	Evolutio	onary biology (6 cred	dits)	Academic Ye	ar 2020
Offering Department	Biological	Sciences		Quota	50
Course Co-ordinator	J D Gaitar	n-Espitia, Biological Scie	ences (jdgaitan@hku.hk)		
Teachers Involved	,	unter, School of Biologica	,		
Course Objectives	-	aitan-Espitia,School of B	students to the major themes of cor	ntemporary evolutionary h	iology including the
Course Objectives	history of framework 2. The co	evolutionary biology, ex k at all levels of biologica ourse emphasizes the i	volutionary processes, adaptation, al organization. interplay between theory and emp	speciation, and evolution	n as an explanatory
Course Contents		with the process of sciend ion to Evolutionary Biolog			
& Topics	-The tree e-Patterns e-Biogeogra-The evolu-Mechanis-Phenotyp-Social integration -Species a-Evolution	of life of evolution aphy ution of biodiversity sms of evolution (Natural bic evolution teractions in evolution (se and speciation of genes and genomes hary Development (Evo-L	Il selection, mutation, genetic drift) ex, kinship, co-evolution)		
Course Learning			course, students should be able to:		
Outcomes		entify the facts on theory	· · · · · · · · · · · · · · · · · · ·		
Cutoomoo	CLO 2 de		of evolution by natural selection a	nd how the process of na	atural selection can
	CLO 3 ur	nderstand mechanisms in	nvolved in the modern evolutionary	theory	
	CLO 4 ap	oply evolutionary thinking	g to real world problems in agricultu	re, medicine, and biodiver	sity conservation
	CLO 5 re	flect and theorize about	evolutionary processes		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BI Not for stu	IOL2306 udents who have passed	d in BIOL3501		
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20	022 : Y	Examination	Dec
Grade Descriptors (A+ to F)	A	range of topics covered by showing strong abilities in dealing with the critical issue		oncepts/theories in solving new n evidence of significant insight	or unfamiliar problems,
	В	ability to handle the proble	ems and materials encountered in the subj	epts, a good understanding of th ject, showing evidence of attair	
	С	ability to handle the proble learning outcomes. Adequate performance dem	ems and materials encountered in the subj	ject, showing evidence of attair ect matter, an ability to handle re	ning most of the course latively simple problems
		ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, b	ems and materials encountered in the subj	ject, showing evidence of attain ect matter, an ability to handle re lost of the expected course learn ity with the subject matter and so	latively simple problems, ing outcomes.
	С	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr inlatively simple problems, t course learning outcomes.	ems and materials encountered in the subj nonstrating some understanding of the subje nmand of knowledge required for attaining m mance demonstrating at least partial familiar	ject, showing evidence of attain act matter, an ability to handle re- lost of the expected course learn ity with the subject matter and s- in knowledge required for attain	ning most of the course latively simple problems, ing outcomes. ome capacity to deal with ing most of the expected
	C D Fail	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, to course learning outcomes. Poor performance in all asy matter, demonstrating deficie	ems and materials encountered in the subje- nonstrating some understanding of the subje- nonstrating some understanding of the subje- nance of the subject of attaining mance demonstrating at least partial familiar but also demonstrating serious deficiencies spects of the course, showing little evidenc- tencies serious enough to make it inadvisable	ject, showing evidence of attain ect matter, an ability to handle re lost of the expected course learn ity with the subject matter and s in knowledge required for attain e of learning, lacking real unde	ning most of the course latively simple problems, ing outcomes. ome capacity to deal with ing most of the expected orstanding of the subject
	C D Fail Lecture wi	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, to course learning outcomes. Poor performance in all asy matter, demonstrating deficit ith laboratory componen	ems and materials encountered in the subje- nonstrating some understanding of the subje- nonstrating some understanding of the subje- nonstrating at least partial familiar but also demonstrating at least partial familiar but also demonstrating serious deficiencies spects of the course, showing little evidenc- tencies serious enough to make it inadvisable to tourse	ject, showing evidence of attain ect matter, an ability to handle re lost of the expected course learn ity with the subject matter and s in knowledge required for attain e of learning, lacking real unde	ning most of the course latively simple problems, ing outcomes. ome capacity to deal with ing most of the expected erstanding of the subject tional course work.
Course Teaching	C D Fail Lecture wi	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, to course learning outcomes. Poor performance in all asy matter, demonstrating deficit ith laboratory componen	ems and materials encountered in the subje- nonstrating some understanding of the subje- nonstrating some understanding of the subje- nance of the subject of attaining mance demonstrating at least partial familiar but also demonstrating serious deficiencies spects of the course, showing little evidenc- tencies serious enough to make it inadvisable	ject, showing evidence of attain ect matter, an ability to handle re lost of the expected course learn ity with the subject matter and s in knowledge required for attain e of learning, lacking real unde	ning most of the course latively simple problems, ing outcomes. ome capacity to deal with ing most of the expected restanding of the subject tional course work. No. of Hours
Course Teaching	C D Fail Lecture wi Activities Lectures	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perfor relatively simple problems, to course learning outcomes. Poor performance in all asy matter, demonstrating deficient laboratory components.	ems and materials encountered in the subje- nonstrating some understanding of the subje- nonstrating some understanding of the subje- nonstrating at least partial familiar but also demonstrating at least partial familiar but also demonstrating serious deficiencies spects of the course, showing little evidenc- tencies serious enough to make it inadvisable to tourse	ject, showing evidence of attain ect matter, an ability to handle re lost of the expected course learn ity with the subject matter and s in knowledge required for attain e of learning, lacking real unde	ning most of the course latively simple problems, ing outcomes. ome capacity to deal with ing most of the expected erstanding of the subject tional course work. No. of Hours 24
Course Teaching	C D Fail Lecture wi Activities Lectures Laborator	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, tourse learning outcomes. Poor performance in all asymatter, demonstrating deficit ith laboratory componens.	ems and materials encountered in the subje- nonstrating some understanding of the subje- nonstrating some understanding of the subje- nonstrating at least partial familiar but also demonstrating at least partial familiar but also demonstrating serious deficiencies spects of the course, showing little evidenc- tencies serious enough to make it inadvisable to tourse	ject, showing evidence of attain ect matter, an ability to handle re lost of the expected course learn ity with the subject matter and s in knowledge required for attain e of learning, lacking real unde	latively simple problems, ing outcomes. ome capacity to deal withing most of the expected pretaining of the subject tional course work. No. of Hours 24 24
Course Teaching	C D Fail Lecture with Activities Lectures Laborator Project with Activities Lectures Laborator Project with Activities Lectures Laborator Project with Activities Lectures Laborator Project with Activities Lectures Laborator Project with Activities Lectures Laborator Project with Activities Lectures Laborator Project with Activities Lectures Laborator Project With Activities La	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, tourse learning outcomes. Poor performance in all asymatter, demonstrating deficit ith laboratory componens.	ems and materials encountered in the subje- nonstrating some understanding of the subje- nonstrating some understanding of the subje- nonstrating at least partial familiar but also demonstrating at least partial familiar but also demonstrating serious deficiencies spects of the course, showing little evidenc- tencies serious enough to make it inadvisable to tourse	ject, showing evidence of attain ect matter, an ability to handle re lost of the expected course learn ity with the subject matter and s in knowledge required for attain e of learning, lacking real unde	latively simple problems, ing outcomes. ome capacity to deal withing most of the expected stretching of the subject tional course work. No. of Hours 24 24 12
Course Teaching	C D Fail Lecture wi Activities Lectures Laborator Project wi Tutorials	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, t course learning outcomes. Poor performance in all asymatter, demonstrating deficitith laboratory components.	ems and materials encountered in the subje- nonstrating some understanding of the subje- nonstrating some understanding of the subje- nonstrating at least partial familiar but also demonstrating at least partial familiar but also demonstrating serious deficiencies spects of the course, showing little evidenc- tencies serious enough to make it inadvisable to tourse	ject, showing evidence of attain ect matter, an ability to handle re lost of the expected course learn ity with the subject matter and s in knowledge required for attain e of learning, lacking real unde	latively simple problems, ing outcomes. ome capacity to deal withing most of the expected erstanding of the subject tional course work. No. of Hours 24 24 12 6
Course Teaching & Learning Activities	C D Fail Lecture with Activities Lectures Laborator Project with Tutorials Reading //	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, it course learning outcomes. Poor performance in all asymatter, demonstrating deficient laboratory components.	ems and materials encountered in the subjectionstrating some understanding of the subjection manual of knowledge required for attaining manual manual encounterating at least partial familiar but also demonstrating serious deficiencies expects of the course, showing little evidenciencies serious enough to make it inadvisable to Course Details	ject, showing evidence of attain ext matter, an ability to handle re- lost of the expected course learn ity with the subject matter and s- in knowledge required for attain e of learning, lacking real unde e to proceed further without addi	ning most of the course latively simple problems, ing outcomes. ome capacity to deal with ing most of the expected irstanding of the subject tional course work. No. of Hours 24 24 12 6 100
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	C D Fail Lecture wi Activities Lectures Laborator Project wi Tutorials	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, it course learning outcomes. Poor performance in all asymatter, demonstrating deficient laboratory components.	ems and materials encountered in the subje- nonstrating some understanding of the subje- nonstrating some understanding of the subje- nonstrating at least partial familiar but also demonstrating at least partial familiar but also demonstrating serious deficiencies spects of the course, showing little evidenc- tencies serious enough to make it inadvisable to tourse	ject, showing evidence of attain ect matter, an ability to handle re lost of the expected course learn ity with the subject matter and s in knowledge required for attain e of learning, lacking real unde	latively simple problems, ing outcomes. ome capacity to deal withing most of the expected erstanding of the subject tional course work. No. of Hours 24 24 12 6
Course Teaching & Learning Activities Assessment Methods	C D Fail Lecture wi Activities Lectures Laborator Project wi Tutorials Reading / Methods Assignment	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, becourse learning outcomes. Poor performance in all asy matter, demonstrating deficit laboratory componens. Ty Ork / Self study	ems and materials encountered in the subjectionstrating some understanding of the subjection manual of knowledge required for attaining manual manual encounterating at least partial familiar but also demonstrating serious deficiencies expects of the course, showing little evidenciencies serious enough to make it inadvisable to Course Details	ject, showing evidence of attain act matter, an ability to handle report of the expected course learn ity with the subject matter and so in knowledge required for attain a of learning, lacking real under to proceed further without additional actions and the course grade (%)	latively simple problems, ing outcomes. ome capacity to deal withing most of the expected withing most of the subject tional course work. No. of Hours 24 24 12 6 100 Assessment Methods
Course Teaching & Learning Activities Assessment Methods	C D Fail Lecture wi Activities Lectures Laborator Project wi Tutorials Reading / Methods	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, becourse learning outcomes. Poor performance in all asy matter, demonstrating deficit laboratory componens. Ty Ork / Self study	ems and materials encountered in the subjectionstrating some understanding of the subjection manual of knowledge required for attaining manual manual encounterating at least partial familiar but also demonstrating serious deficiencies expects of the course, showing little evidenciencies serious enough to make it inadvisable to Course Details	ject, showing evidence of attain act matter, an ability to handle record of the expected course learn ity with the subject matter and so in knowledge required for attain e of learning, lacking real under to proceed further without additional edge. Weighting in final course grade (%)	latively simple problems, ing outcomes. ome capacity to deal withing most of the expected virstanding of the subject tional course work. No. of Hours 24 24 12 6 100 Assessment Methods to CLO Mapping
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	C D Fail Lecture with Activities Lectures Laborator Project with Tutorials Reading / Methods Assignment Examinat J.C. Herrod Douglas J	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, it course learning outcomes. Poor performance in all asymatter, demonstrating deficitith laboratory componens. Ty ork / Self study ents tition on and S. Freeman: Evol J. Futuyma: Evolution, (3)	ems and materials encountered in the subjectionstrating some understanding of the subjection manual of knowledge required for attaining manual manual encounterating at least partial familiar but also demonstrating serious deficiencies expects of the course, showing little evidenciencies serious enough to make it inadvisable to Course Details	ject, showing evidence of attain act matter, an ability to handle record of the expected course learn ity with the subject matter and so in knowledge required for attain e of learning, lacking real under to proceed further without additional weighting in final course grade (%) 60 40 2013)	latively simple problems, ing outcomes. In
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	C D Fail Lecture with Activities Lectures Laborator Project with Tutorials Reading / Methods Assignment Examinat J.C. Herrod Douglas Jebooks averaged to the control of the	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, it course learning outcomes. Poor performance in all asymatter, demonstrating deficitiful laboratory components. Ty Ork / Self study ents tition on and S. Freeman: Evol J. Futuyma: Evolution, (3) vailable	ems and materials encountered in the subjectionstrating some understanding of the subjection and of knowledge required for attaining manace demonstrating at least partial familiar but also demonstrating serious deficiencies spects of the course, showing little evidenciencies serious enough to make it inadvisable to course Details Details Details Lutionary Analysis (5th ed. Pearson,	ject, showing evidence of attain act matter, an ability to handle record of the expected course learn ity with the subject matter and so in knowledge required for attain e of learning, lacking real under to proceed further without additional weighting in final course grade (%) 60 40 2013)	latively simple problems, ing outcomes. In
Course Teaching & Learning Activities Assessment Methods	C D Fail Lecture wi Activities Lectures Laborator Project wi Tutorials Reading / Methods Assignme Examinat J.C. Herro Douglas J eBooks av http://moo	ability to handle the proble learning outcomes. Adequate performance dem but showing incomplete com Minimally acceptable perforr relatively simple problems, it course learning outcomes. Poor performance in all asymatter, demonstrating deficitiful laboratory components. Ty Ork / Self study ents tion on and S. Freeman: Evol J. Futuyma: Evolution, (3) vailable odle.hku/hk	ems and materials encountered in the subjectionstrating some understanding of the subjection and of knowledge required for attaining manace demonstrating at least partial familiar but also demonstrating serious deficiencies spects of the course, showing little evidenciencies serious enough to make it inadvisable to course Details Details Details Lutionary Analysis (5th ed. Pearson,	weighting in final course grade (%) Weighting in final course grade (%) Weighting in final course grade (%) 60 40 2013) 3)	aning most of the course latively simple problems, ing outcomes. One capacity to deal withing most of the expected extending of the subject tional course work. No. of Hours 24 24 12 6 100 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4

BIOL3508	Microbial physiology and biotechnology (6 credits)	Academic Year	2020

Offering Department	Biological			Quota	60			
Course Co-ordinator	-	Biological Sciences (a)	yan8@hku.hk)					
Teachers Involved	-	Biological Sciences)						
Course Objectives	pharmace Biotechno application such as e knowledge	probes are amazing and important entities on earth. Knowledge of microbes is widely applied in food immaceutics, biotechnologies, diseases control, and biogeochemical processes. Microbial Physiology and technology provides both molecular basis for understanding of these important processes and up-to-dai disciplines of Microbiology, and to serve as essential foundations for sub-disciplines of Microbiology has environmental, food, and medicinal Microbiology. Upon completion, students will acquire fundament will be about microorganisms, gain laboratory skills on methodologies for microbial studies, and be able by the knowledge in Microbial Biotechnologies.						
Course Contents & Topics	Microbial Breath', a interesting methodolo control', 'E biofuels a	robial Biotechnology, This course is organized and presented in three themes: 'Microbial Rules', 'Microbial ath', and 'Microbial Biotechnology'. Under these three themes, a broad range of highly educational and resting topics are presented including: 'Microorganisms and their position in the living world', 'Fundamental hodologies for the study of microbes', 'Microbial structures and functions', 'Microbial growth and trol', 'Energy Generation', 'Central metabolism', and 'Microbial biotechnological applications in biodegradation, uels and synthetic biology '. Topics are taught in a coherent manner with a highly interactive tutorial session owing each of the topics such that students will achieve a high quality, stimulating, and problem-based learning						
Course Learning	On succes	ssful completion of this	course, students should be able	to:				
Outcomes		• • • • • • • • • • • • • • • • • • • •	of microbial metabolisms and a					
			oles underlying the dynamic natu	1 7 07				
			methodologies for microbial stu					
Dua va m. 1-14			actical application of microbes in	industry and medicine				
Pre-requisites (and Co-requisites and Impermissible combinations)	Not for stu Not for stu	ass in BIOL2103 or BIOL2220 or BIOC2600 or BIOC3604; of for students who have passed in BIOL3108; and of for students who have passed in BIOL4402.						
Offer in 2020 - 2021 Grade Descriptors	Y 1st	sem Offer in 2021 - 2	1022 : Y Istery at an advanced level of extensi	Examination				
(A+ to F)	B C D	knowledge to a wide range Demonstrate substantial c outcomes. Show evidence some unfamiliar situations. Demonstrate general but in evidence of some analytic. Apply moderately effective Demonstrate partial but lir evidence of some coherer knowledge to solve probler Demonstrate little or no e analytical and critical abiliti Organizational skills are mi	miled command of knowledge required nt and logical thinking, but with limited so. Apply limited or barely effective orga svidence of command of knowledge re es, logical and coherent thinking. Show nimally effective or ineffective.	ations. Apply highly effective organiza ge required for attaining at least mo- ogical thinking, and ability to apply k irred for attaining most of the course in ng, and ability to apply knowledge to I for attaining some of the course lean analytical and critical abilities. Sho mizational skills.	tional skills. st of the course learning nowledge to familiar and learning outcomes. Show most familiar situations. earning outcomes. Show w limited ability to apply rning outcomes. Lack of			
Course Type	Lecture w	th laboratory compone	nt course					
Course Teaching	Activities	•	B. (. 9).					
l carnina Astivitica		•	Details		No. of Hours			
x Leanning Activities	Lectures		Details		24			
a Learning Activities	Laborator	у	Details		24 24			
& Learning Activities	Laborator Project w	y ork	Details		24 24 12			
_	Laborator Project we Reading	у			24 24 12 100			
Assessment Methods	Laborator Project w	y ork	Details	Weighting in final course grade (%)	24 24 12 100 Assessment Methods			
Assessment Methods	Laborator Project we Reading	y ork Self study			24 24 12 100 Assessment			
Assessment Methods	Laborator Project w Reading / Methods	y ork Self study ion		course grade (%)	24 24 12 100 Assessment Methods to CLO Mapping			
Assessment Methods	Laborator Project w Reading / Methods	y ork Self study ion		course grade (%)	24 24 12 100 Assessment Methods to CLO Mapping CLO 1,2,4			
Assessment Methods and Weighting Required/recommended reading and	Laborator Project w Reading / Methods Examinat Laborator Test Primary T Prescott, Woolverto Suppleme Brock Bio Pearson F On-line te	y ork Self study ion y reports ext Book: Harley, and Klein's M n, published by McGra ntary Reading: logy of Microorganisms publisher extbook of Bacteriology	Details Microbiology, by Joanne M. Ww-Hill by, by Michael Madigan, John Macker (Control of Wisco	course grade (%) 50 30 20 /illey, Linda M. Sherwood,	24 24 12 100 Assessment Methods to CLO Mapping CLO 1,2,4 CLO 1,3,4 CLO 1,2 and Christopher J.			
Assessment Methods	Laborator Project w Reading / Methods Examinat Laborator Test Primary T Prescott, Woolverto Suppleme Brock Bio Pearson F On-line te (http://www	y ork Self study ion y reports ext Book: Harley, and Klein's M n, published by McGra ntary Reading: logy of Microorganisms	Details Microbiology, by Joanne M. Ww-Hill by, by Michael Madigan, John Macker (Control of Wisco	course grade (%) 50 30 20 /illey, Linda M. Sherwood,	24 24 12 100 Assessment Methods to CLO Mapping CLO 1,2,4 CLO 1,3,4 CLO 1,2 and Christopher J.			

BIOL3606	Diet and disease (6 credits)	Academic Year	2020			
Offering Department	Biological Sciences	Quota	70			
Course Co-ordinator	Dr J C Y Lee, Biological Sciences (jettylee@hku.hk)					
Teachers Involved	(Dr J C Y Lee,School of Biological Sciences)					
Course Objectives	This course aims to provide understanding and insight into diseases associal specifically to: 1. Explain the relationships between diet and disease. 2. Describe the role of diet in the development and prevention of common chronic obesity and anorexia, cardiovascular disease, cancer, immune deficiency and respectively. Differentiate risk factors that influence dietary choice. 4. Describe the rationales for postoperative nutritional support for hospitalized particular.	ic diseases such a enal failure.				
Course Contents & Topics	The basics of nutrition for health and fitness and medical nutrition therapy. The prevention of chronic diseases such as cancer, diabetes, obesity and anor cardiovascular diseases, renal failure, etc. Malnutrition. Nutrition and immune fu	exia as well as	bulimia nervosa,			

	food aller	rgy and food intolerance.	Nutrition in pregnancy and lactation	on.				
Course Learning	On succe	essful completion of this c	ourse, students should be able to	•				
Outcomes	CLO 1 discuss the different relationships between diet and disease							
			t in the development and pre ancer, immune deficiency, and ren		esity and anorexia,			
			erpret risk factors that influence d					
			postoperative nutritional support					
Pre-requisites			r BIOL3202 or BIOL3203 or BIOL					
(and Co-requisites and Impermissible combinations)		for students who have passed in BIOL3206						
Offer in 2020 - 2021	Y 2n	nd sem Offer in 2021 - 2	022 · Y	Examination	No Exam			
Grade Descriptors (A+ to F)	A	Demonstrate thorough mas learning outcomes. Thoroug of original thought, and abil effective organizational and	tery at an advanced level of extensive lends for the subject. Show strong analy ity to apply knowledge to a wide range or presentational skills. Apply highly effective propriate and insightful conclusions. Apply	knowledge and skills required for tical and critical abilities and logi of complex, familiar and unfamili e laboratory/fieldwork skills and	or attaining all the course cal thinking, with evidence ar situations. Apply highly techniques. Critical use of			
	В	Demonstrate substantial collearning outcomes. Substantial ability to apply knowledge to	mmand of a broad range of knowledge a tial grasp of the subject. Show evidence to familiar and some unfamiliar situations eldwork skills and techniques. Correct us	nd skills required for attaining a of analytical and critical abilities s. Apply effective organizational	t least most of the course and logical thinking, and and presentational skills.			
	С							
	D							
	Fail	Demonstrate little or no evid or no grasp of the knowled thinking. Show very little or effective or ineffective. Appl	lence of command of knowledge and skills ge and understanding of the subject. La no ability to apply knowledge to solve prol y minimally effective or ineffective labora v appropriate conclusions. Organization a	ck of analytical and critical abili blems. Organization and present tory / fieldwork skills and techni	ties, logical and coherent ational skills are minimally ques. Misuse of data and			
Course Type	Lecture v	with laboratory componen		•	•			
Course Teaching	Activitie	• •	Details		No. of Hours			
& Learning Activities	Lectures				24			
-	Laborato	ory			36			
	Reading	/ Self study			50			
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignm	nents	Assignment & Presentation (Individual)	40	CLO 1,2,3			
	Laborato	ory reports		30	CLO 1,3			
	Presenta	ation	Final presentation (Individual)	30	CLO 1,2,3,4			
Required/recommended			ilable on the class website.					
reading and			d Diet Therapy (7th ed.) Suitor &	•	es and Application ir			
online materials	Health P	romotion Wardlaw Gordor	n: Perspectives in Nutrition (2nd e	ed.)				
Course Website		odle.hku.hk/						
Additional Course Information	This cour	rse will be offered subject	to a minimum enrollment number	and availability of teacher	S.			

BIOL3608	Food co	ommoditi	es (6 credit	is)				Academic Year	2020
Offering Department	Biologica	al Sciences						Quota	30
Course Co-ordinator	Prof N P	Shah, Biolo	gical Science	s (npsha	h @hku.hk	·)			
Teachers Involved	Dr L Zha	ang,Śchool (l of Biological of Biological S ool of Biologic	Sciences)) [′]				
Course Objectives			road understan production,				d technologies	used in agriculture _l	products including
Course Contents & Topics	Principles of animal nutrition and feed formulation; genetic selection and breeding of farm animals; slaughter and carcass inspection; meat preservation and safety; sensory quality of meat. Dairy processing emphasizing fermented products such as cheese and yogurt; probiotics and health effects. Grain production related to milling; dough rheology; the baking process and quality. Meat, dairy and grain product marketing.								
Course Learning Outcomes	CLO 1 ur CLO 2 de in CLO 3 de	understand r demonstrate n processing demonstrate	g, preservation knowledge o	ces in me and und n or impr f selected	eat, dairy a erstanding ovement o d issues re	nd grain p of meat a of meat and lated to m	production and dairy senso d dairy product eat and dairy s	afety	echnologies used
Pre-requisites (and Co-requisites and Impermissible combinations)	Not for st Not for st	CLO 4 understand the technology behind the production of grain-based foods Pass in BIOL3201 or (BIOL2101 and any level 3 BIOL course); and Not for students who have passed in BIOL3210; Not for students who have passed in BIOL4207; and Not for students who have passed in BIOL4208.							
Offer in 2020 - 2021	Y 2nd		er in 2021 - 2					Examination	May
Grade Descriptors (A+ to F)	A	evidence o analysis of	f creative ability	and compe to draw ap	etence in pro opropriate an	fessional-lev d insightful o	el problem solving	l and critical abilities and g. Critically use lab skills world problems. Demon	and techniques and
	В	Demonstra	te substantial gr	rasp of the	subject ma	tter covered.	Show evidence	of analytical and critical	abilities and logical

Additional Course Information	The cours	e will be offered subjecte	ed to a minimum enrollment	number and availability of te	acehrs.
Course Website		dle@hku.hk			
Required/recommended reading and online materials	Dairy Prod			ara, N Shah (Eds) (Blackwell, H, and Walker CE (2004)	2008)
	Test		Continuous assessment	20	CLO 1,2,3,4
	Laborator	y reports		20	CLO 1,2,3
	Examinat	on		60	CLO 1,2,3,4
Assessment Methods and Weighting	Methods		Details	Weighting in fin course grade (%	
	Reading / Self study				100
-	Laboratory				24
& Learning Activities	Lectures			24	
Course Teaching	Activities		Details	No. of Hours	
Course Type	Lecture wi	Demonstrate ineffectiveness th laboratory component	team-based organizational and pr t course	resentational skills.	
	Fail	and logical thinking, and min data and results ineffective	imal competence in professional-le ly, leading generally to inappropr	information, of the subject matter of evel problem solving. Use lab skills a riate and usually erroneous conclu	and techniques and analysis of
	D	evidence of coherent and le techniques and analysis of problems. Demonstrate team	ogical thinking, but lacking comp data and results to draw somet n-based organizational and presen	relevant information, of the subject etence in professional-level problet imes appropriate but often erroned tational skills of limited effectiveness	m solving. Use lab skills and ous conclusions to real-world s.
	С	and logical thinking with limi data and results to draw m moderately effective team-ba	ted competence in professional-le oderately appropriate but sometir ased organizational and presentati		and techniques and analysis of world problems. Demonstrate
		data and results to draw organizational and presentat	generally appropriate conclusion tional skills.	vel problem solving. Use lab skills ans to real-world problems. Demon	nstrate effective team-based

BIOL3951	Ecolog	y & biodiversity	field course (6 credits)	Academic Yea	r 2020				
Offering Department		I Sciences	,	Quota	20				
Course Co-ordinator	Dr L Kard	czmarski, Biological	Sciences (leszek@hku.hk)	'					
Teachers Involved	(Dr L Kar	czmarski,Biological	Sciences)						
Course Objectives			apstone experience and will require in	tense study of a topic relevan	t to				
•	the Ecolo	gy & Biodiversity M	lajor during a field course, inside or ou	tside Hong Kong.					
Course Contents & Topics	the topic	and locality involve will involve lecture	erent potential courses may be offered. ved and will therefore vary according es, seminars and extensive field and coordinator for further information on the	to the specific course bein follow-up laboratory work.	g held. The basi				
Course Learning	On succe	essful completion of	f this course, students should be able to	o:					
Outcomes	CLO 1 u	inderstand of the bi	odiversity and primary habitats in the e	cosystem studied					
	CLO 2 e	stablish the basic s	kills needed to identify target species a	associated with the field cours	е				
		e knowledgeable accosystems studied	about and able to implement sampli	ng techniques for organisms	in the particula				
	CLO 4 u	inderstand the basic	c ecology of target species and how bid	otic and abiotic factors shape	focal communities				
Pre-requisites	Pass in a	s in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or							
and Co-requisites	BIOL4XX	L4XXX) in the Ecology & Biodiversity Major.							
and Impermissible		is capstóne course is fór Ecology & Bíodiversity Major students only.							
combinations)	The earli	est that a student is	allowed to take this capstone course i	s their year 3 study.					
Offer in 2020 - 2021	N Of	fer in 2021 - 2022 :	N	Examination					
(A+ to F)		skills. Ample evidence comparative perspect presentation skills we level.	ant background reading and case studies. Exemples of independent critical thought with excellent citive to draw insightful and logical conclusions, ith excellent analytical argumentation. Excellent	use of a broad range of fundamenta Show outstanding abilities of indep or outstanding work relative to what	I concepts and broade pendent work, effective at is required at degre				
	B Evidence of a good grasp of the subject and relevant research techniques. Interest in learning and good-to-moderate familiarity with relevant background reading and case studies. Good handling of field data collection and commendable analytical skills. Good evidence of critical thought (although not always independent), with an appreciable use of fundamental concepts and consideration of broader comparative perspective in drawing logical conclusions. Good abilities of independent work, effective presentation skills with logical and analytical argumentation. Work more than sufficient for what is required at degree level.								
	C Demonstrate an adequate, but incomplete grasp of the subject and relevant research techniques. Moderate familiarity with relevant background reading and case studies, but no interest in learning beyond the adequate average level. Evidence of logical critical thinking (although not always independent), with mostly good use of fundamental concepts to draw logical conclusions. Fair presentation skills, with mostly correct argumentation, but limited (or no) abilities to integrate broader concepts. Work sufficient for what is required for degree level.								
	D	Demonstrate some research techniques abilities of critical inc	grasp of the subject, but only partial and with . Some familiarity with relevant case studies, begendent thinking. Ineffective presentation skil propriate conclusions. Work barely meets what is	out insufficient evidence of backgrouls with generally weak logical argum	nd reading and limite				
	Fail	background reading	sic a minimum grasp of the subject and the and no familiarity with any relevant examples presentation skills with poor argumentation and	and case studies. Inadequate evide	nce of coherent logical				
Course Type	Field can	nps							
Course Teaching	Activitie	s	Details		No. of Hours				
Learning Activities	Field wo	rk			42				
	Reading	/ Self study			100				
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mappin				
	Assignm	ents		35	CLO 1,2,3,4				
	, .cc.giiiii				0_0 .,_,0, 1				

	Report	investigation & presenation (30%)	65	CLO 1,2,3,4
Required/recommended reading and online materials	Students will be direct	ted to relevant scientific literautre and websites		
Course Website	http://www.biosch.hku	ı.hk/ecology/lsc/		
Additional Course Information	Subclass A: Marine M Subclass B: Animal B Enrollment Procedure The course is open to to submit a brief (max (leszek@hku.hk) not I 1. Personal and acad 2. ID photograph 3. Brief description of 4. GPA 5. Pre-requisite cours waiver) All applications will be	ehaviour Field Course e: e enrollment only during the add/drop period of the 2nd cimum 1-page) application letter (PDF file) via e-mail to later than 11 January 2016. The application shall included	the Course Coo le the following: met, a reasoned	rdinator d request for

BIOL3991	Directe	d studies in ec	ology & biodiversity (6 credits)	Academic Ye	ar 2020			
Offering Department	Biologica	l Sciences		Quota				
Course Co-ordinator	Dr S W Y	/ Sin, Biological Sc	ciences (sinyw@hku.hk)					
Teachers Involved		(All academic staff in E&B Major / E&B Major (Intensive) Major,Biological Sciences) (All academic staff in E&B Major / E&B Major (Intensive) Major,Biological Scineces)						
Course Objectives	Students	will undertake a	dissertation on a topic related to the field	d of ecology and biodiversi	ty. The dissertatio			
·	study. C including	will not involve any practical research in terms of laboratory or fieldwork, but will take the form of a desk-top study. Conducting a dissertation is an independent learning experience and will enable students to develop skills including the use of library and Web-based resources; the logical development of scientific arguments; written presentation skills; and personal time management.						
Course Contents	-		topic will be selected from a predetermin	ted list and following discus	sion with a member			
& Topics	of Ecolog	of Ecology & Biodiversity staff, who will act as the student's supervisor. Formal teaching will be limited and aimed at introducing students to the techniques necessary for successful completion of their dissertation.						
Course Learning	On succe	essful completion of	of this course, students should be able to:	•				
Outcomes	CLO 1 id	CLO 1 identify a relevant scientific question or knowledge gap						
	CLO 2 e	stablish a desk-top	p literature approach to test the question	posed / address the knowle	dge gap			
			opriate research to test the question / add g statistical analyses where appropriate	dress the knowledge gap us	sing sound scientif			
	CLO 4 d	Iraw appropriate so	cientific conclusions from their research					
	CLO 5 p	resent their resear	rch as a scientific paper					
Pre-requisites	Pass in	ass in at least 24 credits of advanced level disciplinary core / elective courses in the Ecology & Biodiversity						
and Co-requisites		Major / Ecology & Biodiversity (Intensive) Major.						
and Impermissible			Ecology & Biodiversity Major / Ecology &		ijor students only.			
ombinations)			is allowed to take this capstone course is					
Offer in 2020 - 2021 Grade Descriptors	Y 1s		Offer in 2021 - 2022 : Y lete or near-complete understanding and a thore	Examination	No Exam			
	B C D	Demonstrate compi Evidence of near-cu of learning outcome designed scientific effective, critical, as Evidence of adequa most of the learning Adequately design Demonstrate adequ Evidence of limited learning outcomes, designed scientific and poorly organize Evidence of poor ou attained. Poor critic	esigned scientific approach to test research hypothe rehensive, critical, assessment of findings and profe perplete understanding and a good grasp of the subses. Good critique and knowledge of relevant literatu approach to test research hypothesis. Show gesessment of findings and good presentation of reseate understanding and grasp of the subject matter goutcomes. Acceptable critique and knowledge of red scientific approach to test research hypothemate but not necessarily critical, assessment of finding understanding and grasp of the subject matter as Limited critique and knowledge of relevant literapproach to test research hypothesis. Show fair orgodassessment of findings and limited presentation of rinadequate understanding and grasp of the subject matter and knowledge of relevant literature and identification of the subject matter as the subject matter and knowledge of relevant literature and identification of the subject matter as the subject matter and knowledge of relevant literature and identification of the subject matter as the subject matter and knowledge of relevant literature and identification.	essional presentation of research woject matter as demonstrated by a rer and identification of research hood organizational and/or analyticarch work. as demonstrated by general but it elevant literature and identification esis. Show fair organizational angs and presentation of research work. as demonstrated by incomplete attrature and identification of research used to the second properties of the second properties	work. Ittainment of the major Ittainment of the major Ittainment of the major Ittainment of menostrat Incomplete attainment Incomplete Inco			
			ion and assessment of findings and poor presentati	on of research work.				
Course Type		ased course						
Course Teaching	Activitie		Details		No. of Hours			
Learning Activities		/ Self study	at least 120 hours on the disserta	ation or project	120			
Assessment Methods nd Weighting	Methods	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mappin			
	Oral pres	sentation		30	CLO 1,2,3,4			
	Researc	h report	Written report (<10000 words)	70	CLO 1,2,3,4,5			
Course Website	http://mo	odle.hku.hk	· · · · · · · · · · · · · · · · · · ·					
Additional Course Information	and on h		n the supervisor and student. Guidance tite scientifically. Students should spend a by be assigned.					

BIOL3992	Directed studies in food & nutritional science (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	

Course Co-ordinator	Dr T Sobko (1st and 2nd Semester), Dr J C Y Louie (Summer), Biological Sciences (tsobko@hku.hk; jimmyl@hku.hk)						
Teachers Involved	(All acade	(All academic staff in Food & Nutritional Science Major, School of Biological Sciences) (All academic staff in Food & Nutritional Science Major, School of Biological Sciencesi)					
Course Objectives		This course aims to provide a stimulating capstone experience for all Food & Nutritional Science Major undergraduates to integrate and apply their knowledge and skills obtained from the Major.					
Course Contents & Topics	student's commitm course (a methodol	The directed study can be a review of literature on a specific topic, or a lab or field study that enhances the student's understanding of the topic in the field of food & nutritional science. The student should obtain the commitment of a supervisor in the area of the dissertation topic before submitting the registration form for the course (available from the General Office of School of Biological Sciences). Supervisor will introduce various methodologies/techniques and guide students to completion of the dissertation. Teaching will be informal and students will gain knowledge through discussion and feedback from their supervisors.					
Course Learning			s course, students should be able to:				
Outcomes	CLO 1 CLO 2		cess of scientific enquiry anding of the nature of food & nutritiona	I science			
	CLO 3		eds to address important issues in variou				
			ectual skills that will be valubale for all s				
Pre-requisites and Co-requisites and Impermissible combinations)	BIOL4XX This caps	(X) in the Food & Nutri stone course is for Foo	Idvanced level disciplinary core/elective tional Science Major. Id & Nutritional Science Major students owed to take this capstone course is the	only.	ses (BIOL3XXX o		
Offer in 2020 - 2021	Y 1s	t sem 2nd sem Sui	mmer Offer in 2021 - 2022 : Y	Examination	No Exam		
Grade Descriptors (A+ to F)	A	dissertation topic, showing of the research; compred comprehensive and up-toproblems and their solul well-connected and presskills. The length of the academic standard.	n level of scholarship and originality; virtually ng a thorough grasp of the topic from background nensive exploration of the topic, personal synthesi o-date references integrated into argument or log tions and implications; thought-provoking discuss ented logically with clarity of goals, demonstrating dissertation meet the specified requirements. A	reading and analysis; clear statical reasoning; critical evaluations; accurate summary. All cl excellent organizational, rhetotal there aspects of the dissertation of	tement of the objective oper from the literature in so of the main points of napters/paragraphs are rical and presentations conform to a high		
	Work showing some evidence of originality and insight in identifying, generating and communicating competing arguments, perspectives or problem solving approaches; demonstrating substantial understanding of fundamental concepts of the field of study; adequate grasp of the topic from background reading and analysis; a systematic exploration of the topic which may include an attempt at critical comment or appraisal; regular support provided from the literature; comprehensive and up-to-date references included; main points fully elaborated; summary given in the final chapter/paragraphs; communicating information and ideas clearly and fluently, demonstrating good organizational, rhetorical and presentational skills. The length of the dissertation meet the specified requirements. Most aspects conform to a high academic standard.						
	Work showing no evidence of originality and insight, but the presentation demonstrated adequate understanding and comprehension of most aspects of the dissertation topic; essential topic materials have been read and acknowledged; the main points presented in logically sequential paragraphs; reasonably balanced discussion of the major issues; acceptable interpretation of the topic, some explanation, illustration and support provided from the literature; summary given in the final chapter/paragraphs; most presentation details met (front page, margin, legibility, citations correctly reported and tabulated, etc.); few typos or grammatical errors; Most aspects conform to an acceptable academic standard.						
	D	Demonstrating superficia minimum of information, critical thinking; argume information or ideas. dis quotations with little ex acknowledgements and	al or partial or faulty understanding of the fundan poorly digested and not very well organized in pr ents undeveloped or inappropriate or unsuppo sesertation topic not fully covered; discussion too (planation; insufficient support from literature; light bibliography; some major points missed. Mini	nental concepts of the field of sesentation; irrelevant material; rted; lack of clarity or struct brief or just repeating the da reading not well incorporated imum conform to an acceptable	showing no evidence of ure in communicating ta or findings; overus into the text; limited academic standard.		
	Fail	understanding fundamer ideas; unreflective; inco acknowledgements or bi the course. The written w	was not covered acceptably; demonstrating of tal concepts; materials largely irrelevant; incon oberent argument; complete misinterpretation bliography); structure confused or not discernible work is not of an academic standard.	nplete or confusing communic of the topic or data; no evice	ation of information of dence of reading (no		
Course Type		ased course					
Course Teaching & Learning Activities	Activitie	s / Self study	Details at least 120 hours on the dissertation	n or project	No. of Hours 120		
Assessment Methods	Methods	•	Details	Weighting in final	Assessment		
and Weighting	metrious	.	Stand	course grade (%)	Methods to CLO Mappin		
	Oral pres	sentation	15 minutes (Plus 5 minutes for questions and answers).	20	CLO 1,2,3,4		
	Researc	h report	Written report 6000-8000 words (excluding figures and references).	80	CLO 1,2,3,4		
Course Website		odle.hku.hl/					
Additional Course	Dogular i	Regular meetings between the supervisor and student. Guidance from the supervisor on the scientific methods and on how to think and write scientifically. Students should spend at least 120 hours on the dissertation or project					

BIOL3993	Directe credits	ed studies in Molecular biology & biotechnology (6	Academic Year	2020					
Offering Department	Biologica	al Sciences	Quota						
Course Co-ordinator	Dr A Yaı	n, Biological Sciences (ayan8@hku.hk)							
Teachers Involved	(All acad	(All academic staff in Molecular Biology & Biotechnology Major, Biological Sciences)							
Course Objectives		This course aims to provide a stimulating capstone experience for all Molecular Biology & Biotechnology Major undergraduates to integrate and apply their knowledge and skills obtained from the Major.							
Course Contents & Topics	student's commitn course (methodo	The directed study can be a review of literature on a specific topic, or a lab or field study that enhances the student's understanding of the topic in the field of molecular biology & biotechnology. The student should obtain the commitment of a supervisor in the area of the dissertation topic before submitting the registration form for the course (available from the General Office of School of Biological Sciences). Supervisor will introduce various methodologies/techniques and guide students to completion of the dissertation. Teaching will be informal and students will gain knowledge through discussion and feedback from their supervisors.							
Course Learning	On succ	essful completion of this course, students should be able to:							
Outcomes	CLO 1	acquaint with the process of science		CLO 1 acquaint with the process of science					
	CLO 2 have a better understanding of the nature of molecular biology & biotechnology								
	CLO 2	have a better understanding of the nature of molecular biology & b	piotechnology						

Pre-requisites (and Co-requisites and Impermissible combinations)	CLO 4 develop the key intellectual skills that will be valubale for all scientific studies Pass in at least 24 credits of advanced level disciplinary core / elective courses in the Molecular Biology & Biotechnology Major. This capstone course is for Molecular Biology & Biotechnology Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.						
Offer in 2020 - 2021	Y 1st sem 2nd sem Offer in 2021 - 2022 : Y Examination No Exam						
Grade Descriptors (A+ to F)	A	dissertation topic, showing a of the research; comprehensive and up-to-diproblems and their solution well-connected and present skills. The length of the dis academic standard.	evel of scholarship and originality; virtually thorough grasp of the topic from background sive exploration of the topic, personal synthesi ate references integrated into argument or logi s and implications; thought-provoking discuss ed logically with clarity of goals, demonstrating secretation meet the specified requirements. A	reading and analysis; clear sta s of the issues with detailed su cal reasoning; critical evaluatic sions; accurate summary. All c excellent organizational, rhet Il other aspects of the dissert	atement of the objectives upport from the literature; ons of the main points or chapters/paragraphs are orical and presentational ation conform to a high		
	В	perspectives or problem so study; adequate grasp of the include an attempt at critical references included; main pideas clearly and fluently, d	nce of originality and insight in identifying, g living approaches; demonstrating substantial in the topic from background reading and analy il comment or appraisal; regular support provi- oints fully elaborated; summary given in the fin emonstrating good organizational, rhetorical a ents. Most aspects conform to a high academii	understanding of fundamental sis; a systematic exploration ded from the literature; compri al chapter/paragraphs; commu and presentational skills. The li	concepts of the field of of the topic which may ehensive and up-to-date unicating information and		
	С	comprehension of most asp points presented in logica interpretation of the topic, s chapter/paragraphs; most p	pe of originality and insight, but the prese ects of the dissertation topic; essential topic na ally sequential paragraphs; reasonably bala some explanation, illustration and support pro- resentation details met (front page, margin, lei rors; Most aspects conform to an acceptable a	naterials have been read and a naced discussion of the ma ovided from the literature; sun gibility, citations correctly report	acknowledged; the main jor issues; acceptable nmary given in the final		
	D						
	Fail	Fail The dissertation topic was not covered acceptably; demonstrating evidence of poor knowledge, understanding fundamental concepts; materials largely irrelevant; incomplete or confusing communica ideas; unreflective; incoherent argument; complete misinterpretation of the topic or data; no evide acknowledgements or bibliography); structure confused or not discernible; Fail to meet most or all of the the course. The written work is not of an academic standard.					
Course Type	Project-b	ased course					
Course Teaching	Activitie	S	Details		No. of Hours		
& Learning Activities	Reading	/ Self study	at least 120 hours on the dissertation	n or project	120		
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Oral pres	sentation	15 minutes (Plus 5 minutes for questions and answers).	20	CLO 1,2,3,4		
	Researc	h report	Written report 6000-8000 words (excluding figures and references).	80	CLO 1,2,3,4		
Course Website	http://mod	odle.hku.hk/					
Additional Course Information	and on he		upervisor and student. Guidance fron entifically. Students should spend at le ssigned.				

BIOL3994	Directed	d studies in bid	ological scien	ces (6 credits)		Academic Year	2020
Offering Department	Biological	l Sciences				Quota	
Course Co-ordinator	Dr S Canı	nicci, Biological S	ciences (cannicc	@hkuk.hk)			
Teachers Involved	(All acade	emic staff in Biolog	gical Sciences Ma	ajor,Biological Scier	ces)		
Course Objectives		•	U	epstone experience Is obtained from the		Sciences Major u	ndergraduates to
Course Contents & Topics	student's a supervis from the methodolo	understanding of sor in the area of e General Offic ogies/techniques	the topic in the fi f the dissertation ce of School and guide stude	rature on a specification on a specification of biological Sents to completion and feedback to completion and feedback to completion on and feedback to completion on and feedback to completion and feedback to c	nces. The stude tting the registra ciences). Supe of the dissertation	nt should obtain the tion form for the rvisor will intro on. Teaching will	ne commitment of course (available oduce various
Course Learning	On succe	ssful completion of	of this course, stu	dents should be ab	e to:		
Outcomes	CLO 1 acquaint with the process of science						
	CLO 2 have a better understanding of the nature of biological sciences						
	CLO 3 apply scientific methods to address important issues in various biological disciplines						
	CLO 4	develop the key is	ntellectual skills t	nat will be valuable	for all scientific s	tudies	
Pre-requisites (and Co-requisites and Impermissible combinations)	BIOL4XX This caps	X) in the Biologica stone course is for	al Sciences Major Biological Scien	el disciplinary core/ : ces Major students this capstone cour	only.		es (BIOL3XXX or
Offer in 2020 - 2021		sem 2nd sem			, -	Examination	No Exam
Grade Descriptors (A+ to F)	A	dissertation topic, s of the research; cor comprehensive and problems and their well-connected and	howing a thorough gimprehensive explorated up-to-date reference solutions and implicate presented logically with the dissertation me	larship and originality; asp of the topic from ba- ion of the topic, persona is integrated into argum- ations; thought-provokin with clarity of goals, dem iet the specified require	ekground reading and synthesis of the issuent or logical reasoning discussions; accur constrating excellent of	d analysis; clear stater les with detailed supping; critical evaluations ate summary. All cha organizational, rhetoric	nent of the objectives ort from the literature; of the main points or pters/paragraphs are al and presentational
	В	perspectives or pro study; adequate gr include an attempt references included	oblem solving approa casp of the topic from at critical comment of the main points fully ela	ality and insight in ider ches; demonstrating sul n background reading a r appraisal; regular sup borated; summary giver good organizational, rh	ostantial understandi and analysis; a syste port provided from th in the final chapter/p	ng of fundamental con ematic exploration of e literature; comprehe earagraphs; communic	ncepts of the field of the topic which may ensive and up-to-date ating information and

	С	meet the specified requirements. Most aspects conform to a high academic standard. Work showing no evidence of originality and insight, but the presentation demonstrated adequate understanding and comprehension of most aspects of the dissertation topic; essential topic materials have been read and acknowledged; the main points presented in logically sequential paragraphs; reasonably balanced discussion of the major issues; acceptable interpretation of the topic, some explanation, illustration and support provided from the literature; summary given in the fina chapter/paragraphs; most presentation details met (front page, margin, legibility, citations correctly reported and tabulated, etc.) few typos or grammatical errors; Most aspects conform to an acceptable academic standard.						
	D	,, ,						
	Fail	understanding fundamenta ideas; unreflective; incohe acknowledgements or biblio	is not covered acceptably; demonstrating I concepts; materials largely irrelevant; incor- rent argument; complete misinterpretation ography); structure confused or not discernible k is not of an academic standard.	nplete or confusing communic of the topic or data; no evi	cation of information or idence of reading (no			
Course Type	Project-b	ased course						
Course Teaching	Activitie	S	Details		No. of Hours			
& Learning Activities	Reading	/ Self study	at least 120 hours on the dissertation	n or project	120			
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Oral presentation		15 minutes (Plus 5 minutes for questions and answers).	20	CLO 1,2,3,4			
	Posearc	search report Written report 6000-8000 words (excluding figures and references).						
	i Nescai C.	Порон	(excluding figures and references).					
Course Website		odle.hku.hk/	(excluding figures and references).					

	Public	ublic health nutrition (6 credits) Academic Year 2020						2020
Offering Department	Biologica	al Sciences				Quota	а	90
Course Co-ordinator	Dr J C Y	Dr J C Y Louie, Biological Sciences (jimmyl@hku.hk)						
Teachers Involved	(Dr J C Y	Louie,Biologica	Science)					
Course Objectives	health th	Public health nutrition unites social sciences and biomedical sciences in preventing disease and improving human health through programs aimed at enhancing good nutritional practices. This course presents a broad overview of the professional practice and essential skills required of a public health nutritionist.						
Course Contents & Topics	Planning Dietary a Developr The epid Malnutrit Food reg Food sec	Public health nutrition: overview, nature and identification of problems. Planning cycle of public health nutrition programs. Dietary assessment methods. Development of dietary guidelines and dietary reference standards The epidemiological study of diet: disease associations. Malnutrition: definitions, prevalence, public health consequences, and interventions. Food regulations and labelling. Food security Public health advocacy						
Course Learning	On succe	essful completion	of this cours	e, students shou	ld be able to:			
Outcomes	CLO 1 h	nave a broad kno	vledge of the	scope and meth	odologies of pu	blic health nutrit	tion	
		nave a clear tech ess-developed ar		•	ge of selected of	examples of pub	olic health r	nutrition cases
	CLO 3 be able to formulate recommendations for action for nutritional interventions at the community level							
	CLO 4 understand the impact of socio-cultural factors on community food choices and consequently on health outcomes							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	ass in BIOL3201 or BIOL3202						
oomonianona _j		or						
	Y 2n	nd sem Offer in	2021 - 2022	: Y		Exam	nination	No Exam
Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Y 2n	Demonstrate thoral learning outcome of original though effective organization	ough mastery a to Thorough gra to and ability to tional and prese	at an advanced leve sp of the subject. Sh apply knowledge to entational skills. Appl	ow strong analytica a wide range of co y highly effective la	vledge and skills re l and critical abilities omplex, familiar and boratory/fieldwork s	equired for atta s and logical th I unfamiliar sit skills and techr	aining all the cour iinking, with eviden uations. Apply high iiques. Critical use
Offer in 2020 - 2021 Grade Descriptors		Demonstrate thoi learning outcome of original though effective organize data and results t Demonstrate sub learning outcome ability to apply ki	ough mastery as Thorough gra is, and ability to iconal and press o draw appropria stantial commar is. Substantial g owledge to fan poratory /fieldwo	at an advanced leve sp of the subject. Sh apply knowledge to entational skills. Appl ate and insightful con do of a broad range rasp of the subject. hiliar and some unfa ork skills and techniq	ow strong analytica a wide range of co y highly effective la clusions. Apply high of knowledge and s Show evidence of a miliar situations. A	vledge and skills re l and critical abilities omplex, familiar and boratory/fieldwork s ally effective organiza skills required for at analytical and critica pply effective organ	equired for atta s and logical that d unfamiliar sital skills and technational and pre attaining at leas al abilities and nizational and	aining all the couninking, with eviden uations. Apply high iques. Critical use sentational skills. It most of the counlogical thinking, a presentational skill
Offer in 2020 - 2021 Grade Descriptors	A	Demonstrate thoi learning outcome of original though effective organize data and results t Demonstrate sub learning outcome ability to apply k Apply effective la effective organizz Demonstrate ger outcomes. Genei thinking, and abil skills. Apply mode	ough mastery as. Thorough grat, and ability to to ional and press draw appropriatantial commar is. Substantial gowledge to fan oratory ffieldwe ional and prese eral but incomple y to apply know rately effective	at an advanced leve sp of the subject. Sh apply knowledge to entational skills. Appl ate and insightful con do of a broad range rasp of the subject. hiliar and some unfa ork skills and techniq	ow strong analytica a wide range of cy highly effective la clusions. Apply high of knowledge and is show evidence of is miliar situations. A les. Correct use of nowledge and skill ect. Show evidenc ar situations. Apply skills and techniqu	vledge and skills re and critical abilities implex, familiar and boratory/fieldwork s sly effective organiza skills required for at analytical and critica pply effective organ data of results to d s required for attai e of some analytic moderately effective es. Mostly correct b	equired for atta s and logical th d unfamiliar sit ikilis and techr ational and pre tatining at leas al abilities and nizational and raw approprial ining most of cal and critical e organization ut some erron	aining all the couninking, with eviden uations. Apply high idiques. Critical use sentational skills. It most of the couninglical thinking, a presentational skill the conclusions. Apin the course learning abilities and logical and presentational and presentational skills.
Offer in 2020 - 2021 Grade Descriptors	B C	Demonstrate thoi learning outcome of original though effective organize data and results to Demonstrate sub learning outcome ability to apply kind Apply effective organization of the control of the con	ough mastery as. Thorough gra is, and ability to to ional and press o draw appropriatantial commar is. Substantial g owledge to fan oratory /fieldwu ional and prese eral but incomple y to apply know y to apply know orately effective oropriate conclual but limited or grasp of the su g, but with limi parely effective ed ability to upresentational	at an advanced leves of the subject. Sh apply knowledge to entational skills. Applite and insightful cond of a broad range rasp of the subject. hiliar and some unfark skills and techniq intational skills. blete command of kite grasp of the subject of the subjec	ow strong analytica a wide range of cc y highly effective la clusions. Apply high of knowledge and show evidence of a miliar situations. A less. Correct use of nowledge and skill ect. Show evidence ar situations. Apply skills and techniquely effective organie e and skills require me relevant inform tical abilities. Show presentational skil s to draw approp	vledge and skills re and critical abilities mplex, familiar and boratory/fieldwork s sly effective organiza skills required for at analytical and critica pply effective organ data of results to d s required for attai e of some analytic moderately effective es. Mostly correct b zational and presen d for attaining some atton of the subject of limited ability to a is. Apply partially e ritate conclusions.	equired for atta s and logical th d unfamiliar sit ikills and techr ational and pre ttaining at leas al abilities and nizational and iraw approprial ining most of all and critical e organization ut some erron ut some erron ut some erron tational skills. e of the cours . Show eviden pply knowledg effective lab / Apply limited	aining all the couninking, with eviden uations. Apply high iques. Critical use sentational skills. It most of the couning it is to sentational skills. It most of the couning it is included in the conclusions. Apply the course learning abilities and logical and presentation eous use of data are learning outcome ce of some cohere e to solve problem fieldwork skills are or barely effective.
Offer in 2020 - 2021 Grade Descriptors	В	Demonstrate thoi learning outcome of original though effective organizate data and results to Demonstrate sub learning outcome ability to apply kind Apply effective la effective organizate per outcomes. Genethinking, and ability skills. Apply mode results to draw at Demonstrate part Partial but limited and logical thinkind, Apply limited or techniques. Limitorganizational and Demonstrate little or no grasp of the thinking. Show we effective or ineffe	bugh mastery as. Thorough grat, and ability to to to to to to to to to to to to to	at an advanced leves of the subject. Sh apply knowledge to entational skills. Applied of a broad range rasp of the subject. Initiar and some unfarks skills and technique to the subject of the subject o	ow strong analytica a wide range of cy highly effective la clusions. Apply high of knowledge and show evidence of a miliar situations. A pure certain stration of the control of the contr	vledge and skills reland critical abilities omplex, familiar and boratory/fieldworks style effective organizaskills required for at analytical and criticapply effective organ data of results to discrete of some analytic moderately effective es. Mostly correct be zational and present of or attaining somation of the subject. I limited ability to a list. Apply partially eriate conclusions. Apply partially eriate conclusions. Aquired for attaining to fanalytical and critiss. Organization and / fieldwork skills ar	equired for attas and logical that a unfamiliar sit is full size and logical that is defined at the size and a labilities and a labilities and a labilities and a labilities and a labilities and a labilities and a labilities and critical e organization and critical e organization ut some erron attational skills. e of the course. Show eviden pply knowledgeffective lab / Apply limited the course lear titical abilities, do presentation, and techniques.	aining all the couninking, with eviden uations. Apply high iques. Critical use isentational skills. It most of the couning it is to the conclusions. Apply the conclusions. Apply the course learning abilities and logical and presentation eous use of data are elearning outcomes of some coherce to solve problem fieldwork skills are or barely effective ining outcomes. Litelogical and coherce all skills are minima. Misuse of data are linkings of data are individually and coherce in the country of the

Course Teaching	Activities	Details		No. of Hours
& Learning Activities	Lectures			36
	Laboratory			24
	Reading / Self study			90
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		50	CLO 1,2,3,4
	Laboratory reports		30	CLO 1
	Test	Mid term	20	CLO 1,2
Required/recommended	Public Health Nutrition (The N	lutrition Society Textbook Se	ries, 2004)	
reading and online materials	MJ Gibney, BM Margetts, JM	Kearney, L Arab (Eds)	•	
Course Website	http://moodle.hku.hk/			
Additional Course Information	This course will be offered su	bject to a minimum enrollmer	nt number and availability of teachers	S.

BIOL4202	Nutritio	n and sports perfe	ormance (6 credits)	Academic Ye	ear 2020		
Offering Department		Sciences	·	Quota	20		
Course Co-ordinator	Dr T Sobl	ko, Biological Science	s (tsobko@hku.hk)	·			
Teachers Involved	(Dr T Sob	ko,School of Biologic	al Sciences)				
Course Objectives	in-depth functions suppleme	To demonstrate evidence-based links between nutrition, exercise and sport performance. More specifically, to gain-depth understanding about how the metabolic demands of exercise influence physiological and cognitive functions and exercise performance. To focus on the role of major macronutrients, minerals, vitamins, antioxidan supplements and hydration in sustaining and enhancing sports performance during short-duration, intermittent a endurance exercise.					
Course Contents & Topics Course Learning Outcomes	adaptation performar Committe (Maughar and/or ha vary betw and anae macronut athletes, requireme On succe	ns to developing monce through approprie: "The amount, coin et al, 2004). The cobitual exercise to perferent athlete grobic exercise. Putting rients; selected microsport foods and suppents in exercise and sesful completion of the ritically examine and contents.	ents differ during habitual exercise etabolic efficiency to competition in triate nutrition, following the recomposition and timing of food intake ourse will firstly examine the physiol form at its best. Secondly, it will invergroups, the difference between energy exercise and sports performance is constraints; fluid balance and hydratic blements; position stands and new proports, ergogenic aids and myths of sis course, students should be able to describe the need of energy, nutrient is stands and means to individual while the need of energy, nutrient is stands and the stands and the stands are the individual while the need of energy in the stands and in the stands are individual while the need of energy.	nutrition. Professional athlommendations of the Integration of the Int	etes enhance their ernational Olympic sports performance" and post-competition at and energy intakes ments during aerobic ude: energy balance and weight gain in ition, nutrient/energy		
	exercise in relation to different sports, individual athletes and performance situations CLO 2 describe the impact of dietary macronutrients, vitamins and minerals on physical performance CLO 3 provide an overview of the position stands on major misconceptions in sports nutrition. E evaluate, explain and communicate current, evidence based epidemiological knowledge position stands. CLO 4 access and analyze the importance of meal frequency, energy source and supplem performance in different sports. CLO 5 demonstrate convincing argument for importance of balanced nutrition for sports performar health.						
	he	ealth.	J J	- -	J		
(and Co-requisites and Impermissible	Pass in B						
(and Co-requisites and Impermissible combinations)	Pass in B			Examination			
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	Pass in B	Demonstrate thorough gevidence of creative abitechniques and analysis highly effective team-batechniques and solutions with some evide and analysis of data and	- 2022: Y grasp of the subject matter covered. Show str lity and competence in professional-level pro of data and results to draw appropriate and sed organizational and presentational skills. Il grasp of the subject matter covered. Sho ence of competence in professional-level prob d results to draw generally appropriate concli	Examination ong analytical and critical abilities blem solving. Critically use quality insightful conclusions to real-work wevidence of analytical and critiem solving. Use quality managem	No Exam and logical thinking, with y management skills and d problems. Demonstrate tical abilities and logical nent skills and techniques		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in B Y 1st	Sem Offer in 2021 Demonstrate thorough gevidence of creative abitechniques and analysis highly effective team-base Demonstrate substantia thinking with some evide and analysis of data and based organizational and Demonstrate general bute and logical thinking with and analysis of data and Demonstrate moderately	- 2022 : Y grasp of the subject matter covered. Show str lity and competence in professional-level pro of data and results to draw appropriate and sed organizational and presentational skills. If grasp of the subject matter covered. Sho ence of competence in professional-level prob d results to draw generally appropriate concli d presentational skills It incomplete grasp of the subject matter cove limited competence in professional-level prob d results to draw moderately appropriate but y effective team-based organizational and pre	Examination ong analytical and critical abilities blem solving. Critically use quality insightful conclusions to real-world we evidence of analytical and crit lem solving. Use quality managem usions to real-world problems. Der ered. Show some evidence of anal elem solving. Use quality managem sometimes erroneous conclusion sentational skills.	No Exam and logical thinking, with y management skills and d problems. Demonstrate tical abilities and logical nent skills and techniques monstrate effective team- lytical and critical abilities nent skills and techniques is to real-world problems.		
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Pass in B Y 1st A B C	Sem Offer in 2021 Demonstrate thorough gevidence of creative abitechniques and analysis highly effective team-ba: Demonstrate substantia thinking with some evide and analysis of data and based organizational am Demonstrate general buten diogical thinking with and analysis of data and Demonstrate moderately Demonstrate partial butevidence of coherent management skills and conclusions to real-work	- 2022 : Y grasp of the subject matter covered. Show str litty and competence in professional-level pro of data and results to draw appropriate and sed organizational and presentational skills. If grasp of the subject matter covered. Sho ence of competence in professional-level prob d results to draw generally appropriate conclit d presentational skills It incomplete grasp of the subject matter cove limited competence in professional-level prob d results to draw moderately appropriate but y effective team-based organizational and pre limited grasp, with retention of some releva and logical thinking, but lacking compete techniques and analysis of data and resi d problems. Demonstrate team-based organiz	Examination ong analytical and critical abilities blem solving. Critically use qualitinsightful conclusions to real-work we evidence of analytical and critlem solving. Use quality managem usions to real-world problems. Derend. Show some evidence of analytem solving. Use quality managem sometimes erroneous conclusion sentational skills. In information, of the subject matnoce in professional-level problem ults to draw sometimes appropriational and presentational skills of	No Exam and logical thinking, with y management skills and d problems. Demonstrate tical abilities and logical nent skills and techniques monstrate effective team- lytical and critical abilities nent skills and techniques is to real-world problems. ter covered. Show some m solving. Use quality ate but often erroneous if limited effectiveness.		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in B Y 1st A B	Sem Offer in 2021 Demonstrate thorough gevidence of creative abitechniques and analysis highly effective team-base of the compostrate substantia thinking with some evide and analysis of data and based organizational and Demonstrate general but and logical thinking with and analysis of data and Demonstrate partial but evidence of coherent management skills and conclusions to real-work Demonstrate little or no and logical thinking, at techniques and analysis	- 2022 : Y grasp of the subject matter covered. Show str litly and competence in professional-level pro of data and results to draw appropriate and sed organizational and presentational skills. If grasp of the subject matter covered. Sho ence of competence in professional-level prob d results to draw generally appropriate concluded presentational skills. It incomplete grasp of the subject matter cove limited competence in professional-level prob d results to draw moderately appropriate but of effective team-based organizational and pre limited grasp, with retention of some releva and logical thinking, but lacking compete techniques and analysis of data and resi	Examination ong analytical and critical abilities blem solving. Critically use quality insightful conclusions to real-work wevidence of analytical and cri lem solving. Use quality managem usions to real-world problems. Der ered. Show some evidence of anal elem solving. Use quality managem sometimes erroneous conclusion sentational skills. Int information, of the subject mat noce in professional-level proble ills to draw sometimes appropria titional and presentational skills of tition, of the subject matter covere- el problem solving. Use quality erally to inappropriate and usually	No Exam and logical thinking, with y management skills and d problems. Demonstrate tical abilities and logical nent skills and techniques monstrate effective team- lytical and critical abilities nent skills and techniques is to real-world problems. tetr covered. Show some m solving. Use quality ate but often erroneous limited effectiveness. di. Show lack of coherent management skills and		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Pass in B Y 1st A B C	Sem Offer in 2021 Demonstrate thorough gevidence of creative abitechniques and analysis highly effective team-base of the compostrate substantia thinking with some evide and analysis of data and based organizational and Demonstrate general but and logical thinking with and analysis of data and Demonstrate partial but evidence of coherent management skills and conclusions to real-work Demonstrate little or no and logical thinking, at techniques and analysis	- 2022: Y grasp of the subject matter covered. Show str litty and competence in professional-level pro of data and results to draw appropriate and sed organizational and presentational skills. If grasp of the subject matter covered. Sho ence of competence in professional-level prob d results to draw generally appropriate concli d presentational skills It incomplete grasp of the subject matter cove limited competence in professional-level prob d results to draw moderately appropriate but y effective team-based organizational and per limited grasp, with retention of some releva and logical thinking, but lacking compete techniques and analysis of data and resu d problems. Demonstrate team-based organiz grasp, with retention of little relevant informa d minimal competence in professional-lev of data and results ineffectively, leading gen-	Examination ong analytical and critical abilities blem solving. Critically use quality insightful conclusions to real-work wevidence of analytical and cri lem solving. Use quality managem usions to real-world problems. Der ered. Show some evidence of anal elem solving. Use quality managem sometimes erroneous conclusion sentational skills. Int information, of the subject mat noce in professional-level proble ills to draw sometimes appropria titional and presentational skills of tition, of the subject matter covere- el problem solving. Use quality erally to inappropriate and usually	No Exam and logical thinking, with y management skills and d problems. Demonstrate tical abilities and logical nent skills and techniques monstrate effective teamilytical and critical abilities nent skills and techniques to real-world problems. Iter covered. Show some m solving. Use quality ate but often erroneous il mitted effectiveness. Id. Show lack of coherent management skills and erroneous conclusions to		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Pass in B Y 1st A B C	Demonstrate thorough gevidence of creative abitechniques and analysis highly effective team-ba: Demonstrate substantia thinking with some evide and analysis of data and based organizational and Demonstrate general butechniques of data and logical thinking with and analysis of data and Demonstrate moderately Demonstrate partial butevidence of coherent management skills and conclusions to real-work Demonstrate little or no and logical thinking, at techniques and analysis real-world problems. Detased course	- 2022: Y grasp of the subject matter covered. Show str litty and competence in professional-level pro of data and results to draw appropriate and sed organizational and presentational skills. If grasp of the subject matter covered. Sho ence of competence in professional-level prob d results to draw generally appropriate concli d presentational skills It incomplete grasp of the subject matter cove limited competence in professional-level prob d results to draw moderately appropriate but y effective team-based organizational and per limited grasp, with retention of some releva and logical thinking, but lacking compete techniques and analysis of data and resu d problems. Demonstrate team-based organiz grasp, with retention of little relevant informa d minimal competence in professional-lev of data and results ineffectively, leading gen-	Examination ong analytical and critical abilities blem solving. Critically use quality insightful conclusions to real-work wevidence of analytical and cri lem solving. Use quality managem usions to real-world problems. Der ered. Show some evidence of anal elem solving. Use quality managem sometimes erroneous conclusion sentational skills. Int information, of the subject mat noce in professional-level proble ills to draw sometimes appropria titional and presentational skills of tition, of the subject matter covere- el problem solving. Use quality erally to inappropriate and usually	No Exam and logical thinking, with y management skills and d problems. Demonstrate tical abilities and logical nent skills and techniques monstrate effective team- lytical and critical abilities nent skills and techniques is to real-world problems. s to real-world problems m solving. Use quality ate but often erroneous limited effectiveness. di. Show lack of coherent management skills and		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Pass in B Y 1st A B C D Fail Lecture-b Activities Lectures	Demonstrate thorough gevidence of creative abitechniques and analysis highly effective team-ba: Demonstrate substantia thinking with some evide and analysis of data and based organizational and Demonstrate general butechniques of data and logical thinking with and analysis of data and Demonstrate moderately Demonstrate partial butevidence of coherent management skills and conclusions to real-work Demonstrate little or no and logical thinking, at techniques and analysis real-world problems. Detased course	- 2022: Y grasp of the subject matter covered. Show str litty and competence in professional-level pro of data and results to draw appropriate and sed organizational and presentational skills. If grasp of the subject matter covered. Sho ence of competence in professional-level prob d results to draw generally appropriate conclit d presentational skills It incomplete grasp of the subject matter cove limited competence in professional-level prob d results to draw moderately appropriate but y effective team-based organizational and pre limited grasp, with retention of some releva and logical thinking, but lacking compete techniques and analysis of data and resu d problems. Demonstrate team-based organiz grasp, with retention of little relevant informa d minimal competence in professional-lev of data and results ineffectively, leading gen- monstrate ineffectiveness team-based organic	Examination ong analytical and critical abilities blem solving. Critically use quality insightful conclusions to real-work wevidence of analytical and cri lem solving. Use quality managem usions to real-world problems. Der ered. Show some evidence of anal elem solving. Use quality managem sometimes erroneous conclusion sentational skills. Int information, of the subject mat noce in professional-level proble ills to draw sometimes appropria titional and presentational skills of tition, of the subject matter covere- el problem solving. Use quality erally to inappropriate and usually	No Exam and logical thinking, with y management skills and d problems. Demonstrate tical abilities and logical nent skills and techniques monstrate effective teamilytical and critical abilities nent skills and techniques to real-world problems. It received the solution of the property of the skills and techniques to real-world problems. It was a considerable of the skills and the skills are skills are skills are skills and the skills are skills are skills are skills are skills are skills are skills and the skills are		
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(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Pass in B Y 1st A B C D Fail Lecture-b Activities Lectures Tutorials Discussion	Demonstrate thorough gevidence of creative abitechniques and analysis highly effective team-base Demonstrate substantia thinking with some evide and analysis of data and based organizational an Demonstrate general bu and logical thinking with and analysis of data an Demonstrate moderately Demonstrate partial but evidence of coherent management skills and conclusions to real-work Demonstrate little or no and logical thinking, at techniques and analysis real-world problems. Details of the second	prasp of the subject matter covered. Show strility and competence in professional-level proof data and results to draw appropriate and sed organizational and presentational skills. If grasp of the subject matter covered. Showed competence in professional-level probing the subject matter covered by the sub	Examination ong analytical and critical abilities blem solving. Critically use quality insightful conclusions to real-work wevidence of analytical and cri lem solving. Use quality managem usions to real-world problems. Der ered. Show some evidence of anal elem solving. Use quality managem sometimes erroneous conclusion sentational skills. Int information, of the subject mat noce in professional-level proble ills to draw sometimes appropria titional and presentational skills of tition, of the subject matter covere- el problem solving. Use quality erally to inappropriate and usually	No Exam and logical thinking, with y management skills and d problems. Demonstrate tical abilities and logical nent skills and techniques monstrate effective teament skills and techniques is to real-world problems. It ter covered. Show some m solving. Use quality ate but often erroneous if limited effectiveness. d. Show lack of coherent management skills and erroneous conclusions to No. of Hours 36 10		
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	Presentation		10	CLO 1,3,4,5
	Project reports		50	CLO 1,4,5
Required/recommended reading and online materials	Most of the reading material will book and journal resources in HKU-Sport Nutrition. An introduction t (2004)Sports and Exercise Nutrition. Will-Modern Nutrition in Health and Dis	J's libraries including: o Energy Production and Perform liam McArdle, Frank Katch, Victor k	nance. Asker Jeukedrup	
Course Website	http://moodle.hku.hk			
Additional Course Information	This course will be offered subject	to a minimum enrollment number a	ind availability of teachers	

Offering Department Course Co-ordinator Teachers Involved (Dr S LI Biological Sciences) (Dr J CY Lee, Biological Sciences) (Dr J CY Lee, Biological Sciences) (Dr J CY Lee, Biological Sciences) (Dr J CY Lee, Biological Sciences) (Dr J CY Lee, Biological Sciences) (Dr J CY Lee, Biological Sciences) (Dr J CY Lee, Biological Sciences) (Dr J CY Lee, Biological Sciences) (Dr J CY Lee, Biological Sciences) (Dr J CY Lee, Biological Sciences) (Dr J CY Lee, Biological Sciences) (Dr J CY Lee, Biological Sciences) (Dr J CY Lee, Biological Sciences) (Dr J Lee, Dr	BIOL4204	Diet, bra	in function and beh	avior (6 credits)	Academic Yea	r 2020	
Teachers Involved (Dr ETS LI Biological Sciences) (Dr JC Y Lee, Biological Sciences) (Dr JC Y Lee, Biological Sciences) (Dr JC Y Lee, Biological Sciences) To highlight the impact of nutrient provision on brain structure and function, and to discuss various effects nutrition and diet on mental function and behaviour. Fundamentals of the central nervous system; Nutrition & brain development; Diet, learning & memory function Dietary CNS stimularist, Neurotransmitters, drugs & behaviour, Physiological and socio-cultural determinants dietary behaviour. On successful completion of this course, students should be able to: CLO 1 understand the basic structure and functions of the brain and how nutrition influences its development. CLO 2 be able to explain the consequences of mainturition on cognition. CLO 3 Appreciate appetite control as a function of food-gut-brain interaction. CLO 4 understand the differences between bloactive food ingredients and drugs. CLO 5 critically evaluate and interpret the internal and external cues that determine dietary behaviour. Pass in BIOL3204, or already enrolled in this course (Art to F) A Demonstrate thorough grasp of the subject matter covered. Show exceptional ability on knowledge integration, problem identification and solving. Show outstanding ability to critically analyze and interpret scientification and solving. Show reasonable ability to critically analyze and interpret scientification and solving show name ability to critically analyze and interpret scientification and solving show name ability to critically analyze and interpret scientification and solving show name ability to critically analyze and interpret scientification and solving show name ability to receive and interpret scientification and solving show name ability to receive and interpret scientification and solving show and solving show name ability to receive and interpret coloridation and solving show and solving show and solving show and solving show and solving show and solving show and solving sh	Offering Department			•	Quota	30	
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BIOL4205	Food technology (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	30
Course Co-ordinator	Prof N P Shah, Biological Sciences (npshah@hku.hk)		
Teachers Involved	(Dr L Zhang,Biological Sciences) (Prof N P Shah,Biological Sciences)		
Course Objectives	To provide students with basic principles and methodologies of food processin cover key engineering principles relevant to the food industry. Students will gain food processing and preservation techniques.		
Course Contents	Food processing is a multidisciplinary field combining applied physical science	nces with knowle	edge of product

& Topics	productio equipmer nutritious methods	n and commercializationt and machinery used consumer food product in food processing ar	n of food products and ser to convert raw agricultural n ts are covered. We discuss	nical knowledge required to imp vices. The design and develop naterials and ingredients into so the basic engineering principles is discussed will include those and extrusion.	oment of processes, afe, convenient, and and applications of			
Course Learning			course, students should be al					
Outcomes	CLO 1 u	nderstand basic principle	es of food processing method	ls and preservation technology				
	CLO 2 b	e able to apply their kno	wledge and practical skills to	process and develop food produ	ıcts			
			nderstanding of selected n	nethods and problems in foo	d processing and			
		preservation						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	IOL3201 or BIOL3209						
Offer in 2020 - 2021	Y 2n	d sem Offer in 2021 - 2	2022 : Y	Examination	May			
Grade Descriptors (A+ to F)	A	changes that take place in and equipment for a varie	variety of food during preparation, p ty of food-specific purposes. Demo y for specific food purposes. Criticall	Show strong evidence of analytical ar processing and storage. Identifies and us postrates advance skills in designing, p y use lab skills and techniques and anal	ses advanced techniques producing and evaluating			
	В	Demonstrate substantial gr that take place in variety of variety of food-specific purp	asp of the subject matter covered. food during preparation, processing coses. Demonstrates high-level skill	Show evidence of analytical and critical and storage. Identifies and uses techniss in designing, producing and evaluating and analysis of data and results to drawn and analysis of data and results to drawn.	ques and equipment for a g solutions of high quality			
	С	abilities and logical thinking of the changes that take place in variety of food during preparation, processing and storage, identifies and uses appropriate techniques and equipment for a variety of food-specific purposes. Demonstrates adequate skills in designing, producing and evaluating solutions of sound quality for specific food purposes. Use lab skills and techniques and analysis of data and results to draw moderately appropriate conclusions.						
	D	Demonstrate partial but lim evidence of coherent and I storage. Identifies and uses	nited grasp, with retention of some ogical thinking of the changes that basic techniques and equipment for valuating solutions for specific food	relevant information, of the subject mat take place in variety of food during pre or a variety of food-specific purposes. De purposes. Use lab skills and techniques	paration, processing and emonstrates basic skills in			
	Fail	Demonstrate little or no gra and logical thinking of he of guidance factors and uses guidance, demonstrates lin	asp, with retention of little relevant in changes that take place in variety of s some appropriate techniques and nited skills in designing, producing a	nformation, of the subject matter covere f food during preparation, processing ar equipment for a limited range of food and evaluating solutions for specific food ely, leading generally to inappropriate	nd storage. Identifies with I-specific purposes. With I purposes. Use lab skills			
Course Type	Lecture w	vith laboratory componer	nt course					
Course Teaching	Activitie		Details		No. of Hours			
& Learning Activities	Lectures				24			
	Laborato		laboratory/field trip/seminar		24			
	Tutorials	•			6			
	Reading	/ Self study			100			
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Examina	tion		60	CLO 1,2,3			
	Laborato	ry reports		20	CLO 1,2,3			
	Test		Continuous assessment	20	CLO 1,2,3			
Required/recommended reading and online materials		cessing Technology-Prir rations in Food Processi	nciples & Practice 3rd Ed P.J. ng - 2nd ed. R.L. Earle	. Fellows				
Course Website	http://mod	odle.hku.hk/						
Additional Course	This cour	se will be offered subjec	t to a minimum enrollment nu	ımber and availability of teachers	S.			
in on mation								

BIOL4207	Meat and	d dairy sciences (6 c	redits)		Academic Year	2020	
Offering Department	Biological	Sciences	•		Quota	50	
Course Co-ordinator	Prof N P S	Shah, Biological Sciences	(npshah@hku.hk)				
Teachers Involved							
Course Objectives		udents a broad understa g and marketing.	nding of modern praction	ce and technologies ι	used in meat and	dairy production,	
Course Contents & Topics	carcass in	of animal nutrition and for aspection; meat preserve products such as cheese	ation and safety; sen	sory quality of mea	t. Dairy processi	ng emphasizing	
Course Learning	On succes	ssful completion of this co	ourse, students should b	e able to:			
Outcomes	CLO 1 understand modern practices in meat and dairy production						
	CLO 2 demonstrate a knowledge and understanding of meat and dairy sensory quality, and the technologies used in processing, preservation or improvement of meat and dairy products						
	CLO 3 de	monstrate knowledge of	selected issues related	to meat and dairy safe	ety		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BI	OL3201					
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : N			Examination		
Grade Descriptors (A+ to F)	Α	Demonstrate thorough grasp evidence of creative ability a analysis of data and results to team-based organizational an	nd competence in profession o draw appropriate and insigh	al-level problem solving. (Critically use lab skills	and techniques and	
	В	Demonstrate substantial gras	sp of the subject matter cov	ered. Show evidence of	analytical and critical	abilities and logical	

	data orga	and results to draw inizational and presentat	generally appropriate co tional skills.	onclusions to real-	solving. Use lab skills and te world problems. Demonstrat	e effective team-based
	and data	logical thinking with limitand results to draw m	ted competence in profes	sional-level problem sometimes erroned	Show some evidence of ana solving. Use lab skills and te ous conclusions to real-world	chniques and analysis of
	evid tech	ence of coherent and length	ogical thinking, but lackir	ig competence in p v sometimes appro	formation, of the subject mat rofessional-level problem so priate but often erroneous of s of limited effectiveness.	ving. Use lab skills and
	Fail Den	nonstrate little or no gras logical thinking, and min and results ineffective	sp, with retention of little r imal competence in profes	elevant information, ssional-level problen nappropriate and us	of the subject matter covere n solving. Use lab skills and to sually erroneous conclusions	echniques and analysis of
Course Type	Lecture with la	poratory component	t course			
Course Teaching	Activities		Details			No. of Hours
& Learning Activities	Lectures					24
	Laboratory					24
	Tutorials					6
	Reading / Self	study				100
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Examination				80	CLO 1,2,3
	Laboratory rep	orts			20	CLO 1,2
Required/recommended reading and online materials			(CRC Press, 2006) urance. RC Chandan	, A Kilara, N Sh	ah (Eds) (Blackwell, 200	08)
Course Website	http://moodle.h	ku.hk/				
Additional Course Information	This course wi	I be offered subject	to a minimum enrollr	nent number an	d availability of teachers	S .

BIOL4208	Meat, o	dairy and grain sc	iences (6 credits)	Academic Ye	ar 2020		
Offering Department	Biologic	al Sciences		Quota	15		
Course Co-ordinator	Prof N F	Shah, Biological Sci	ences (npshah@hku.hk)				
Teachers Involved	(Dr J C	Y Lee, School of Biolo	igcal Science)				
		P Shah,School of Bio					
Course Objectives				and technologies used in agricultui	e products includir		
			ion, processing and marketing.				
Course Contents	Principles of animal nutrition and feed formulation; genetic selection and breeding of farm animals; slaughter an						
& Topics				ory quality of meat. Dairy proce			
				and health effects. Grain production	on related to millin		
Na			rocess and quality. Meat, dairy a				
Course Learning Outcomes			this course, students should be				
Jutcomes			ractices in meat, dairy and grain	•			
			eage and understanding of meat a vation or improvement of meat a	t and dairy sensory quality, and th	e technologies use		
		•	ge of selected issues related to	- · · · · · · · · · · · · · · · · · · ·			
			ology behind the production of c	, ,			
Pre-requisites			101 and any level 3 BIOL course	•			
and Co-requisites			ssed in BIOL3210; and	<i>5)</i> , and			
and Impermissible		students who have pa					
combinations)			3334 2.32 .23.				
Offer in 2020 - 2021	N C	Offer in 2021 - 2022 : N	V	Examination			
Grade Descriptors	Α	Demonstrate thorough	grasp of the subject matter covered. S	Show strong analytical and critical abilities	and logical thinking, w		
(A+ to F)				level problem solving. Critically use lab s			
	analysis of data and results to draw appropriate and insightful conclusions to real-world problems. Demonstrate highly effective team-based organizational and presentational skills.						
	B Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities and logical						
		thinking with some evidence of competence in professional-level problem solving. Use lab skills and techniques and analysis of					
		data and results to draw generally appropriate conclusions to real-world problems. Demonstrate effective team-based organizational and presentational skills.					
	С	Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of analytical and critical abilities					
		and logical thinking with limited competence in professional-level problem solving. Use lab skills and techniques and analysis of					
		data and results to draw moderately appropriate but sometimes erroneous conclusions to real-world problems. Demonstrate moderately effective team-based organizational and presentational skills.					
	D	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Show some					
		evidence of coherent and logical thinking, but lacking competence in professional-level problem solving. Use lab skills and					
	techniques and analysis of data and results to draw sometimes appropriate but often erroneous conclusions to real-world problems. Demonstrate team-based organizational and presentational skills of limited effectiveness.						
	problems. Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Show lack of coherent						
	and logical thinking, and minimal competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results ineffectively, leading generally to inappropriate and usually erroneous conclusions to real-world problems.						
			reness team-based organizational and p		to real-world problem		
Course Type	Lecture	with laboratory compo	onent course				
Course Teaching	Activiti	ies	Details				
Learning Activities	Lecture	es .			24		
	Laborat	tory					
	Reading	g / Self study			100		
Assessment Methods	Method		Details	Weighting in final	Assessment		
				course grade (%)	Methods		
and Weighting				_ ' '			
and Weighting					to CLO Mappin		
and Weighting	Examin	ation		70	CLO 1,2,3,4		

reading and online materials	Dairy Processing and Quality Assurance. RC Chandan, A Kilara, N Shah (Eds) (Blackwell, 2008) Encyclopedia of Grain Science, edited by Wrigley CW, Corke H, and Walker CE (2004)
Course Website	http://moodle@hku.hk
Additional Course Information	The course will be offered subjected to a minimum enrollment number and availability of teacehrs.

BIOL4209	Function	nal foods (6 credi	its)	Academic Year	r 2020		
Offering Department	Biological	Sciences		Quota	40		
Course Co-ordinator	Dr M F Wa	ang, Biological Scien	ices (mfwang@hku.hk)				
Teachers Involved	,	ng,Biological Science	,				
		ang,Biological Scien					
Course Objectives	emphasis	provide a fundamental understanding of the rapidly emerging functional food/nutraceutical industry with an inhabit on the history, regulation, chemical basis and quality control of healthy ingredients/products and their ects on human health.					
Course Contents & Topics	nutraceution fibers as containing	oncept, history and global regulation of functional foods and nutraceuticals; classification of functional foods and utraceuticals based on their chemical structures; unsaturated fatty acids, proteins, food pigments and dietary pers as healthy food ingredients; health benefits of dietary phenolics, terpenes, phytosterols and sulphur- containing compounds; probiotics and prebiotics; small berries, spices, teas and herbs for health; quality control and assurance of functional foods and nutraceuticals.					
Course Learning			nis course, students should be able	to:			
Outcomes			on and global regulation of function				
			ical knowledge of functional food a				
			amples of functional foods and inter		Ith benefits		
	CLO 4 de	monstrate understar	nding of the current functional food	and nutraceutical industry			
	CLO 5 un	nderstand major tech	niques and technologies for quality	control and manufacturing of h	ealthy products		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Blo	OL3201 or BIOL320	2				
Offer in 2020 - 2021	Y 1st s	sem Offer in 2021	- 2022 · Y	Examination	Dec		
Grade Descriptors	A		grasp of the subject matter covered. Show s		1=		
(A+ to F)	evidence of creative ability and competence in professional-level problem solving. Critically use knowledge to draw appropriate and insightful conclusions to real-world problems. Demonstrate highly effective team-based organizational and presentational skills.						
	Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities and logical thinking with some evidence of competence in professional-level problem solving. Use knowledge to draw generally appropriate conclusions to real-world problems. Demonstrate effective team-based organizational and presentational skills.						
	С	Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of analytical and critical abilities and logical thinking with limited competence in professional-level problem solving. Use knowledge to draw moderately appropriate but sometimes erroneous conclusions to real-world problems. Demonstrate moderately effective team-based organizational and presentational skills.					
	D	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Show some evidence of coherent and logical thinking, but lacking competence in professional-level problem solving. Use knowledge to draw sometimes appropriate but often erroneous conclusions to real-world problems. Demonstrate team-based organizational and presentational skills of limited effectiveness.					
		evidence of coherent ar sometimes appropriate	nd logical thinking, but lacking competence in but often erroneous conclusions to real-way	in professional-level problem solving. U	covered. Show som		
	Fail	evidence of coherent ar sometimes appropriate presentational skills of li Demonstrate little or no and logical thinking, a	nd logical thinking, but lacking competence is but often erroneous conclusions to real-wimited effectiveness. o grasp, with retention of little relevant inform of minimal competence in professional-leate and usually erroneous conclusions to re	in professional-level problem solving. U orld problems. Demonstrate team-bas mation, of the subject matter covered. I vel problem solving. Use knowledge	covered. Show som lse knowledge to dra led organizational an Show lack of coherent ineffectively, leading		
	Fail Lecture-ba	evidence of coherent ar sometimes appropriate presentational skills of li Demonstrate little or no and logical thinking, a generally to inappropria organizational and presences ased course	nd logical thinking, but lacking competence is but often erroneous conclusions to real-w- imited effectiveness. It grasp, with retention of little relevant inform and minimal competence in professional-leate and usually erroneous conclusions to re- entational skills.	in professional-level problem solving. U orld problems. Demonstrate team-bas mation, of the subject matter covered. I vel problem solving. Use knowledge	covered. Show som Jse knowledge to draved ed organizational and Show lack of coherer ineffectively, leading citiveness team-base		
Course Teaching	Fail Lecture-ba	evidence of coherent ar sometimes appropriate presentational skills of li Demonstrate little or no and logical thinking, a generally to inappropria organizational and presences ased course	nd logical thinking, but lacking competence is but often erroneous conclusions to real-wimited effectiveness. o grasp, with retention of little relevant inform of minimal competence in professional-leate and usually erroneous conclusions to re	in professional-level problem solving. U orld problems. Demonstrate team-bas mation, of the subject matter covered. I vel problem solving. Use knowledge	covered. Show som Jse knowledge to dra ed organizational an Show lack of coherer ineffectively, leading ctiveness team-base		
Course Teaching	Fail Lecture-ba Activities Lectures	evidence of coherent ar sometimes appropriate presentational skills of li Demonstrate little or no and logical thinking, a generally to inappropria organizational and presences ased course	nd logical thinking, but lacking competence is but often erroneous conclusions to real-wimited effectiveness. grasp, with retention of little relevant inform of minimal competence in professional-leate and usually erroneous conclusions to reentational skills. Details	in professional-level problem solving. U orld problems. Demonstrate team-bas mation, of the subject matter covered. I vel problem solving. Use knowledge	covered. Show som Jse knowledge to dra ed organizational an Show lack of coherer ineffectively, leadin- inctiveness team-base No. of Hours 36		
Course Teaching	Fail Lecture-ba Activities Lectures Tutorials	evidence of coherent ar sometimes appropriate presentational skills of li Demonstrate little or no and logical thinking, a generally to inappropria organizational and presentational and presentational	nd logical thinking, but lacking competence is but often erroneous conclusions to real-w- imited effectiveness. It grasp, with retention of little relevant inform and minimal competence in professional-leate and usually erroneous conclusions to re- entational skills.	in professional-level problem solving. U orld problems. Demonstrate team-bas mation, of the subject matter covered. I vel problem solving. Use knowledge	covered. Show som Jse knowledge to draved organizational an Show lack of coherer ineffectively, leading totiveness team-base No. of Hours 36 12		
Course Teaching & Learning Activities	Fail Lecture-ba Activities Lectures Tutorials	evidence of coherent ar sometimes appropriate presentational skills of li Demonstrate little or no and logical thinking, a generally to inappropria organizational and presences ased course	nd logical thinking, but lacking competence is but often erroneous conclusions to real-wimited effectiveness. grasp, with retention of little relevant inform of minimal competence in professional-leate and usually erroneous conclusions to reentational skills. Details	in professional-level problem solving. U orld problems. Demonstrate team-bas mation, of the subject matter covered. I vel problem solving. Use knowledge	covered. Show som Jse knowledge to dra ed organizational an Show lack of coherer ineffectively, leadin- inctiveness team-base No. of Hours 36		
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials	evidence of coherent ar sometimes appropriate presentational skills of li Demonstrate little or no and logical thinking, a generally to inappropria organizational and presentational and presentational	nd logical thinking, but lacking competence is but often erroneous conclusions to real-wimited effectiveness. grasp, with retention of little relevant inform of minimal competence in professional-leate and usually erroneous conclusions to reentational skills. Details	in professional-level problem solving. Uorld problems. Demonstrate team-bas mation, of the subject matter covered. Evel problem solving. Use knowledge al-world problems. Demonstrate ineffer the world problems of the world problems. Weighting in final course grade (%)	covered. Show som lse knowledge to dra led organizational an Show lack of coherer ineffectively, leadin- ictiveness team-base No. of Hours 36 12		
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials Reading /	evidence of coherent ar sometimes appropriate presentational skills of li Demonstrate little or no and logical thinking, a generally to inappropria organizational and prese ased course	nd logical thinking, but lacking competence is but often erroneous conclusions to real-wimited effectiveness. grasp, with retention of little relevant inform of minimal competence in professional-leate and usually erroneous conclusions to reentational skills. Details tutorials/seminars	in professional-level problem solving. Uorld problems. Demonstrate team-bas mation, of the subject matter covered. Evel problem solving. Use knowledge al-world problems. Demonstrate ineffer the world problems of the world problems. Weighting in final course grade (%)	covered. Show som Jse knowledge to dra led organizational an Show lack of coherer ineffectively, leading totiveness team-base No. of Hours 36 12 100 Assessment Methods		
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods	evidence of coherent ar sometimes appropriate presentational skills of li Demonstrate little or no and logical thinking, a generally to inappropria organizational and prese ased course	nd logical thinking, but lacking competence is but often erroneous conclusions to real-wimited effectiveness. grasp, with retention of little relevant inform of minimal competence in professional-leate and usually erroneous conclusions to reentational skills. Details tutorials/seminars	in professional-level problem solving. Uorld problems. Demonstrate team-bas mation, of the subject matter covered. evel problem solving. Use knowledge al-world problems. Demonstrate ineffer weighting in final course grade (%)	covered. Show som Jse knowledge to dra led organizational an Show lack of coherer ineffectively, leadin- ictiveness team-base No. of Hours 36 12 100 Assessment Methods to CLO Mappine		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati R. E. C. W	evidence of coherent ar sometimes appropriate presentational skills of li Demonstrate little or no and logical thinking, a generally to inappropria organizational and prese ased course	nd logical thinking, but lacking competence is but often erroneous conclusions to real-wimited effectiveness. grasp, with retention of little relevant inform of minimal competence in professional-leate and usually erroneous conclusions to reentational skills. Details tutorials/seminars	in professional-level problem solving. Uorld problems. Demonstrate team-bas mation, of the subject matter covered. It well problem solving. Use knowledge lad-world problems. Demonstrate ineffe Weighting in final course grade (%) 30 70 ods (CRC Press, 2007)	covered. Show som Jse knowledge to dra ed organizational an Show lack of coheret ineffectively, leadin- ctiveness team-base No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5 CLO 1,2,3,4,5		
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials Course Website	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinatii R. E. C. W C. M. Hasi	evidence of coherent ar sometimes appropriate presentational skills of li Demonstrate little or no and logical thinking, a generally to inappropria organizational and prese ased course	nd logical thinking, but lacking competence is but often erroneous conclusions to real-wimited effectiveness. It grasp, with retention of little relevant inform and minimal competence in professional-leate and usually erroneous conclusions to resentational skills. Details	in professional-level problem solving. Uorld problems. Demonstrate team-bas mation, of the subject matter covered. It well problem solving. Use knowledge lad-world problems. Demonstrate ineffe Weighting in final course grade (%) 30 70 ods (CRC Press, 2007)	covered. Show som Jse knowledge to dra ed organizational an Show lack of coheret ineffectively, leadin- ctiveness team-base No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5 CLO 1,2,3,4,5		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials Course Website	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati R. E. C. W C. M. Hasl	evidence of coherent ar sometimes appropriate presentational skills of li Demonstrate little or no and logical thinking, a generally to inappropria organizational and prese ased course Self study Self study ents ion //ildman: Handbook of ler: Regulation of Ful	nd logical thinking, but lacking competence is but often erroneous conclusions to real-wimited effectiveness. It grasp, with retention of little relevant inform and minimal competence in professional-leate and usually erroneous conclusions to resentational skills. Details	in professional-level problem solving. Uorld problems. Demonstrate team-bas mation, of the subject matter covered. Evel problem solving. Use knowledge hal-world problems. Demonstrate ineffe weighting in final course grade (%) 30 70 ods (CRC Press, 2007) a Global Perspective (IFT Pres	covered. Show som Jse knowledge to dra ed organizational an Show lack of cohere ineffectively, leadin activeness team-base No. of Hours 36 12 100 Assessment Methods to CLO Mappin CLO 1,2,3,4,5 CLO 1,2,3,4,5		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati R. E. C. W C. M. Hasl	evidence of coherent ar sometimes appropriate presentational skills of li Demonstrate little or no and logical thinking, a generally to inappropria organizational and prese ased course Self study Self study ents ion //ildman: Handbook of ler: Regulation of Ful	nd logical thinking, but lacking competence is but often erroneous conclusions to real-wimited effectiveness. grasp, with retention of little relevant inform of minimal competence in professional-leate and usually erroneous conclusions to reentational skills. Details	in professional-level problem solving. Uorld problems. Demonstrate team-bas mation, of the subject matter covered. Evel problem solving. Use knowledge hal-world problems. Demonstrate ineffe weighting in final course grade (%) 30 70 ods (CRC Press, 2007) a Global Perspective (IFT Pres	covered. Show son Jse knowledge to dra ed organizational ar Show lack of cohere ineffectively, leadir activeness team-base No. of Hours 36 12 100 Assessment Methods to CLO Mappin CLO 1,2,3,4,5 CLO 1,2,3,4,5		

BIOL4210	Food p	product development (6 credits) Academic	'ear	2020		
Offering Department	Biologic	al Sciences Quota		40		
Course Co-ordinator	Dr M F Wang, Biological Sciences (mfwang@hku.hk)					
Teachers Involved	(Dr M F	Wang, Biological Sciences)				
Course Objectives		To introduce the key concepts and techniques used in food product development. To provide small group experience in the design, development and production of a new food product.				
Course Contents & Topics	develop	History and future of the food industry; industrial product development process; idea generation and prototype development for new food products; quality management and legal protection; marketing strategies; food labeling; food package design; new product development for different food industries.				
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1	erstand the food product development cycle				
	CLO 2 know the key steps in new product development					
	CLO 3 demonstrate enhanced insight and understanding of current and future trends in the food industry					
	CLO 4	have professional level practical experience in new product development				
	CLO 5 know the main characteristics of different sectors of the food industry					

Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOL3203 or BIOL4205						
Offer in 2020 - 2021	N Of	fer in 2021 - 2022 : N		Examination			
Grade Descriptors (A+ to F)	Α						
	В						
	С						
	D	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Show some evidence of coherent and logical thinking, but lacking competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results to draw sometimes appropriate but often erroneous conclusions to real-world problems. Demonstrate team-based organizational and presentational skills of limited effectiveness.					
	Fail						
Course Type	Laborator	ry and workshop course					
Course Teaching	Activitie	s	Details		No. of Hours		
& Learning Activities	Laborato	ry			48		
	Group w	ork	80-100 hours group project work		100		
	Tutorials		10 lectures + 12 tutorials		22		
	Reading / Self study				100		
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm	ents	assessment of group product development project including in- class presentation	80	CLO 1,2,3,4,5		
	Test		·	20	CLO 1,2,3,4,5		
Required/recommended reading and online materials	E. Graf a	nd I. S. Saguy: Food Pro	ping New Food Products for a Changir duct Development (Avi Books, 1991) evelopment (CRC Press, 2005)	ng Marketplace (CRC Pr	ess, 2007)		
Course Website		ner. New Pood Product D odle.hku.hk/	evelopment (CNC Fless, 2005)				
Additional Course			to a minimum enrollment number and	availability of teachers			
Information	THIS COUR	se wiii be ollered subject	to a minimum emoliment number and	avaliability of teachers.			

BIOL4301	Fish and	I fisheries (6 credits) Academ	ic Year	2020		
Offering Department	Biological	Sciences Quota		40		
Course Co-ordinator	TBC, Biol	ogical Sciences ()				
Teachers Involved	(TBC,)					
Course Objectives	 to acquaint students with the principles governing interrelationships among fishes as well as with biotic and abiotic aspects of their environment for an understanding of population dynamics and multispecies interactions. to provide an understanding of how species diversity and selected aspects of their life history are relevant to fishery management challenges, sustainable supply of seafood, and the conservation of threatened species. to cover the theoretical and practical aspects of marine fisheries management, fish farming and fish conservation using local, regional and global examples 					
Course Contents & Topics	marine ar fisheries; roles of managem	Introduction to course: phylogenetic, biological and ecological concepts and adaptation. Multispecies interactions in marine and freshwater fish assemblages. Fishery theory; how do fisheries work? Status of the world's capture fisheries; fish stock assessment and fishery management practices using local, regional and global examples. The roles of mariculture and capture fisheries for seafood supply and relationship to capture fisheries. Fishery management and fish conservation. Conclusion: fish biodiversity and fishery production; ethics of fish research and exploitation; climate change and the future of fish and fisheries.				
Course Learning	On succe	ssful completion of this course, students should be able to:				
Outcomes	CLO 1 understand the basis of fish species diversity in relation to phylogenetic, ecological and biological factors CLO 2 appreciate the direct and indirect impacts and consequences of human activities on fish species and species assemblages and implications for seafood security CLO 3 understand of the functioning of fisheries and standards of fisheries assessment, development and					
	management					
	CLO 4 appreciate the mutual dependency of humans with fished populations in relation to their long-term sustainability					
	CLO 5 enhance the ability for critical and synthetic thinking and to consider innovative approaches to research and management					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	Pass in BIOL3301 or BIOL3303				
Offer in 2020 - 2021	N Off	er in 2021 - 2022 : N Examina	tion			
Grade Descriptors (A+ to F)	Α	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of origing and synthesize information, and ability to apply knowledge to a wide range of complex, familiar highly effective presentational skills. Strong evidence of clear attention to thoughtful and reflective	inal thoug and unfan	ht, ability to integrate		
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attain learning outcomes. Show evidence of analytical and critical abilities and logical thinking, integrapply knowledge to familiar and some unfamiliar situations. Demonstrate effective presentat attention to thoughtful and reflective thinking.	ation of m	aterials and ability to		

	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective presentational skills. Little evidence of clear attention to thoughtful and reflective thinking.					pply knowledge to most
	D	Show evidence of some co	pherent and logical thinkin lity to apply knowledge to s	e and skills required for attaining so g, but with limited analytical and olve problems. Apply limited effectiv	critical abilitie	es and little attempt at
	Fail	of analytical and critical ab problems. Organization and	ilities, logical and coherer	edge and skills required for attaining it thinking. Show very little or no nimally effective or ineffective.		
Course Type	Lecture-ba	sed course				
& Learning Activities	Activities		Details			No. of Hours
	Lectures					24
	Field work		Field, laboratory, practical and tutorials			36
	Reading / Self study					100
Assessment Methods and Weighting	Methods		Details	Weighting course gra		Assessment Methods to CLO Mapping
	Assignme	nts		30		CLO 1,2,3,4,5
	Examinati	on		60		CLO 1,2,3,4,5
	Test			10		CLO 3
Required/recommended reading and online materials	Science Lt	d, 2002)	,	Biology and Fisheries (Volumeishes (Blackwell Science, 19		lackwell
Course Website	http://www	.biosch.hku.hk/ecology/	sc/			
Additional Course Information		ernate year from 2017 e will be offered subject		ent number and availability c	of teachers.	

BIOL4302	Enviror	nmental impact as	sessment (6 credits)	Academic Y	ear 2020	
Offering Department	Biologica	l Sciences	,	Quota	30	
Course Co-ordinator	Dr J Wu,	Biological Sciences (iinwu @hku.hk)	<u>'</u>		
Teachers Involved	(Dr C H F	Hau,Biological Sceince	es)			
	(Dr J Wu	,Biological Sciences)				
Course Objectives		luce the general prirssessment (EIA).	nciples, processes, techniques, c	current practices and probler	ns of environmenta	
Course Contents & Topics	Background and history of EIA development. Concept of carrying capacity and precautionary principle. EIA legislation. Processes in conducting EIA. Risk assessment and management. Mitigatory measures and remediation. Cost benefit analysis. Socio-economic perspectives and analysis. Project monitoring and audit Common techniques employed in EIA (e.g. matrix, sequence diagram, causal chain analysis, modeling). Modern EIA instruments (environmental liability, environmental insurance and environmental share). Application of EIA in environmental management. Case studies. Role play exercise.					
Course Learning			is course, students should be able	e to:		
Outcomes	CLO 1	understand the opera	tion of EIA systems in Hong Kong	and overseas		
	CLO 2	apply a variety of tech	nniques in assessing environmenta	al impact		
	CLO 3	evaluate different opti	ons and determine acceptability ir	n environmental impact asses	sment	
	CLO 4	prepare EIA reports for	or small scale projects			
Pre-requisites (and Co-requisites and Impermissible combinations)	,	Pass in (BIOL2103 or BIOL2306); and (ENVS3004 or any BIOL3XXX course)				
Offer in 2020 - 2021	Y 2n	d sem Offer in 2021	- 2022 : Y	Examination	No Exam	
Grade Descriptors (A+ to F)	В	outcomes. Show strong and synthesize informat highly effective presents Demonstrate substantia learning outcomes. Sho apply knowledge to far	mastery at an advanced level of extensive analytical and critical abilities and logical tion, and ability to apply knowledge to a wattonal skills. Strong evidence of clear atter il command of a broad range of knowledge we vidence of analytical and critical abilimiliar and some unfamiliar situations. Do	I thinking, with evidence of original the diderange of complex, familiar and untion to thoughtful and reflective think age and skills required for attaining at the and logical thinking, integration	nought, ability to integrate nfamiliar situations. Apply ing. least most of the course of material sand ability to	
	attention to thoughtful and reflective thinking. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective presentational skills. Little evidence of clear attention to thoughtful and reflective thinking.					
	D Fail	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities and little attempt at integration. Show limited ability to apply knowledge to solve problems. Apply limited effectiveness in presentational skills. Lack of attention to thoughtful and reflective thinking.				
	Fail Demonstrate little or no evidence or command or knowledge and skills required for attaining the course learning outcomes Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solv problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type		vith laboratory compor	nent course		No. of Hours	
Course Teaching	Activitie		Details	Details		
& Learning Activities	Lectures					
	Field wo		field trip / tutorials		24	
	Reading	/ Self study	student center learning		70	
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignm	ents		80	CLO 1,2,3,4	
	Laborato	ory reports		20	CLO 2	
Required/recommended reading and online materials	2005) HKSAR		Chadwick: Introduction to Enviror cal Memorandum for Environmer	•	`	

	References: To be provided in classes
Course Website	http://moodle.hku.hk
Additional Course Information	The course will be offered subject to a minimum enrollment number and availability of teachers.

BIOL4303		oehaviour (6 credits	5)	Academic Yea	r 2020	
Offering Department	Biological			Quota	30	
Course Co-ordinator	Dr L Karcz	zmarski, Biological Scie	nces (leszek@hku.hk)			
Teachers Involved	T1 ·					
Course Objectives	insights in functions of and other	to a field of science that of specific behaviours; the organisms; how animale oung; how complex anim	e ways and means of exploring and u at investigates everything animals do, he ways in which animals interact with s find and defend resources, avoid pre mal societies are formed and how beh	including the underlying each other, with their ph dators, choose mates, re	g mechanisms and hysical environmen eproduce, and care	
Course Contents			nts to scientific reasoning and conce	otual basis of an under	standing of anima	
& Topics	behaviour How does are some the hunte complex a be explair as possibl the rest of within the behaviour research t will also il	and behavioural ecolo behaviour develop wit species monogamous of Several animal speared effective survival structure of the group? In this cour paradigm of behaviour. We will discuss sever that represents the curr	gy. What causes specific behaviour a hin the individual's lifetime and what it while others are polygamous? What m icies, including humans, tend to live rategy. However, how could, for instar is mechanism which emphasizes the re- is living in small groups like squirrels, rese, based upon ecological and evoluti- al ecology and understand the causes al classical studies that form the foun- tent concepts which have led to mode ten the recent extraordinary advances	and what are the underly functions does it serve? akes one organism the in groups; social life is not, the birth of sterile corproductive success of a would an individual risk onary principles, studenty, functions, development dation of this field, as wern understanding of ani	ying mechanisms? For example; why hunter and anothe s among the most astes, like in bees ss many individuals its own life to save is will learn to thinl at, and evolution of tell as more recen mal behaviour. We	
Course Learning	On succes	ssful completion of this of	course, students should be able to:			
Outcomes	CLO 2 ap	preciate the complexity preciate current theorie	uses, functions, development, and evo of interactions between environmenta is that form basis for modern understar ing and methodology in the field of Ani	I selective pressures and nding of animal behaviou	d animal behaviour	
			s of behavioural ecology, animal so		city, and how the	
Dro roguioitos		* .	behaviour contributes to its conservat	ion		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOL2306; and Pass in one of the following courses: BIOL3301, BIOL3313, BIOL3319, BIOL3320 or BIOL3419 Not for students who have passed in BIOL3101					
Offer in 2020 - 2021		er in 2021 - 2022 : N		Examination		
Grade Descriptors (A+ to F)	В	excellent use of named examples and case studies. Evidence of independent critical thought with excellent use of a broad range of fundamental concepts to draw insightful and logical conclusions. Show eagerness to learn, great abilities of independent work, effective presentation skills with excellent analytical argumentation. Excellent or outstanding work relative to what is required at degree level.				
	С	required at degree level. Demonstrate an adequate, but not coherent and incomplete grasp of the subject, with limited background reading and limited use of named examples and case studies. Some abilities of logical critical thinking, but not insightful and/or independent; only partial				
		abilities to use acquired knowledge and work independently to draw meaningful conclusions. Fair presentation skills, with mostl correct argumentation, but limited (or no) abilities to integrate broader concepts. Work sufficient for what is required for degree level.				
	D	studies. Insufficient evidence	f the subject, but partial and limited to the most se of background reading, limited abilities of criti- nerally weak logical argumentation and restrict	cal independent thinking, and i	d limited (or none) case	
	Fail	No evidence of basic mini familiarity with any relevant	ed at degree level. imum knowledge and understanding of the su examples and case studies. Inadequate eviden on and no abilities to draw meaningful conclusio	ce of coherent logical thought;	ate conclusions. Work round reading and no ineffective presentation	
Course Type		No evidence of basic mini familiarity with any relevant	imum knowledge and understanding of the su examples and case studies. Inadequate eviden- on and no abilities to draw meaningful conclusio	ce of coherent logical thought;	ate conclusions. Work round reading and no ineffective presentation	
Course Teaching		No evidence of basic mini familiarity with any relevant skills with poor argumentation ith laboratory componer	imum knowledge and understanding of the su examples and case studies. Inadequate eviden- on and no abilities to draw meaningful conclusio	ce of coherent logical thought;	ate conclusions. Work round reading and no ineffective presentation level. No. of Hours	
Course Teaching	Lecture wi	No evidence of basic mini familiarity with any relevant skills with poor argumentati ith laboratory componer	imum knowledge and understanding of the su examples and case studies. Inadequate evidenon and no abilities to draw meaningful conclusiont course Details Including field trips, site visits, intersional country including field trips.	ce of coherent logical thought; ns. Work fails to reach degree	ate conclusions. Work round reading and no ineffective presentation level.	
Course Teaching	Lecture wind Activities Lectures Laborator Project we	No evidence of basic mini familiarity with any relevant skills with poor argumentation th laboratory componer s	imum knowledge and understanding of the su examples and case studies. Inadequate eviden- on and no abilities to draw meaningful conclusion t course Details	ce of coherent logical thought; ns. Work fails to reach degree	ate conclusions. Work round reading and no ineffective presentation level. No. of Hours 24 32 8	
Course Teaching & Learning Activities	Lecture wi Activities Lectures Laborator Project wi Reading /	No evidence of basic mini familiarity with any relevant skills with poor argumentation th laboratory componer is	imum knowledge and understanding of the su examples and case studies. Inadequate evidenon and no abilities to draw meaningful conclusion to course Details	ce of coherent logical thought; ns. Work fails to reach degree	ate conclusions. Work round reading and no ineffective presentation level. No. of Hours 24 32 8 60	
Course Teaching & Learning Activities Assessment Methods	Lecture wind Activities Lectures Laborator Project we	No evidence of basic mini familiarity with any relevant skills with poor argumentation th laboratory componer is	imum knowledge and understanding of the su examples and case studies. Inadequate evidenon and no abilities to draw meaningful conclusion to course Details including field trips, site visits, intersessions, classroom debates project work review Details Details	ce of coherent logical thought; ns. Work fails to reach degree	ate conclusions. Work round reading and no ineffective presentation level. No. of Hours 24 32 8	
Course Teaching & Learning Activities Assessment Methods	Lecture wi Activities Lectures Laborator Project wi Reading /	No evidence of basic minifamiliarity with any relevant skills with poor argumentation the laboratory componer is series of	imum knowledge and understanding of the su examples and case studies. Inadequate evidenon and no abilities to draw meaningful conclusion to course Details	ce of coherent logical thought; ns. Work fails to reach degree active practical/visual Weighting in final	ate conclusions. Work round reading and no ineffective presentation level. No. of Hours 24 32 8 60 Assessment Methods to CLO	
Course Teaching & Learning Activities Assessment Methods	Lecture wi Activities Lectures Laborator Project wi Reading / Methods	No evidence of basic mini familiarity with any relevant skills with poor argumentatic ith laboratory componer in the skills with poor argumentation in the skills with poor argumentation in the skills with laboratory componer in the skills with laborato	imum knowledge and understanding of the su examples and case studies. Inadequate evidenon and no abilities to draw meaningful conclusion to course Details including field trips, site visits, intersessions, classroom debates project work review Details Details	ce of coherent logical thought; ns. Work fails to reach degree active practical/visual Weighting in final course grade (%)	ate conclusions. Work round reading and no ineffective presentation level. No. of Hours 24 32 8 60 Assessment Methods to CLO Mapping CLO 1,2,3,4,5	
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended	Lecture wi Activities Lectures Laborator Project wi Reading / Methods Assignme Examinat Bolhuis J	No evidence of basic minifamiliarity with any relevant skills with poor argumentation in the laboratory componer in the laboratory componer is self-study. York Self study ents ion J. & Giraldeau L.A.	imum knowledge and understanding of the su examples and case studies. Inadequate evidenon and no abilities to draw meaningful conclusion to course Details	ce of coherent logical thought; ns. Work fails to reach degree active practical/visual Weighting in final course grade (%) 55 45	nate conclusions. Work round reading and no ineffective presentation level. No. of Hours 24 32 8 60 Assessment Methods to CLO Mapping CLO 1,2,3,4,5 CLO 1,2,3,4,5	
Course Teaching & Learning Activities Assessment Methods and Weighting	Lecture wind Activities Lectures Laborator Project wind Reading / Methods Assignment Examinat Bolhuis J Publishing Danchin E Dugatkin I	No evidence of basic minifamiliarity with any relevant skills with poor argumentativith laboratory componer or services. Y ork Self study ents ion J. & Giraldeau L.A. (2005) J., Giraldeau L-A. & Cez L.A. Principles of Anima	imum knowledge and understanding of the su examples and case studies. Inadequate evidence and no abilities to draw meaningful conclusion to course Details	weighting in final course grade (%) 55 45 sms, Function, and Eveniversity Press 2008) & Company 2009)	nate conclusions. Work round reading and no ineffective presentation level. No. of Hours 24 32 8 60 Assessment Methods to CLO Mapping CLO 1,2,3,4,5 CLO 1,2,3,4,5	
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Lecture wind Activities Lectures Laborator Project wind Reading / Methods Assignment Examinat Bolhuis J Publishing Danchin E Dugatkin I Breed M.D.	No evidence of basic minifamiliarity with any relevant skills with poor argumentativith laboratory componer or services. Y ork Self study ents ion J. & Giraldeau L.A. (2005) J., Giraldeau L-A. & Cez L.A. Principles of Anima	imum knowledge and understanding of the su examples and case studies. Inadequate evidence on and no abilities to draw meaningful conclusion to course Details	weighting in final course grade (%) 55 45 sms, Function, and Eveniversity Press 2008) & Company 2009)	nate conclusions. Work round reading and no ineffective presentation level. No. of Hours 24 32 8 60 Assessment Methods to CLO Mapping CLO 1,2,3,4,5 CLO 1,2,3,4,5	

Information This course will be offered subject to a minimum enrollment number and availability of teachers.

		d services (6 credits)	Academic Ye			
Biological Sciences Or B D Russell Biological Sciences (brussell@hku.hk)				30		
	· •					
they provincluding how hum						
Natural ed services of may be p marine er to human can provide	Natural ecosystems provide trillions of dollars' worth of ecosystem services to humans every year. Many of these services go unrecognized and undervalued. In fact, because humans rely on ecosystems many of these services may be priceless. This course will first cover the function of different ecosystems from terrestrial, fresh water and marine environments. Students will then be introduced to the concept of ecosystem services and what they provide to human populations. Finally, human activities which degrade ecosystems and reduce the extent that ecosystems can provide these services, and what that means for human populations, will be covered. Students will develop independent and creative thinking when proposing solutions to the question of how to value ecosystems for their					
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CLO 1 D CLO 2 E: CLO 3 D CLO 4 D						
Pass in	one of the following of	courses: BIOL3301 or BIOL3303	or BIOL3313 or BIOL3319	9 or ENVS3019 o		
N Off	er in 2021 - 2022 : Y		Examination			
В	familiarity with relevant ba skills. Ample evidence of comparative perspective presentation skills with ex level. Evidence of a good grasp	independent critical thought with excellent uto draw insightful and logical conclusions. iccellent analytical argumentation. Excellent or of the subject and relevant research technic	lary handling of field data collection ise of a broad range of fundament Show outstanding abilities of inde or outstanding work relative to wh iques. Interest in learning and goo	n and excellent analytica al concepts and broade ependent work, effective nat is required at degree de-to-moderate familiarit		
	with relevant background reading and case studies. Good handling of field data collection and commendable analytical skills. Good evidence of critical thought (although not always independent), with an appreciable use of fundamental concepts and consideration of broader comparative perspective in drawing logical conclusions. Good abilities of independent work, effective presentation skills with logical and analytical argumentation. Work more than sufficient for what is required at degree level. Demonstrate an adequate, but incomplete grasp of the subject and relevant research techniques. Moderate familiarity with					
	presentation skills with log	comparative perspective in drawing logical jical and analytical argumentation. Work mor	re than sufficient for what is require	ependent work, effectived at degree level.		
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	Dr B D Ri (Dr B D R (Dr B D R This cour they provincluding how hum increase I Natural eservices of may be p marine er to human can provi independinherent p On succe CLO 1 D CLO 2 E CLO 3 D CLO 4 D CLO 5 D events of the ENVS300	Dr B D Russell, Biological Scien (Dr B D Russell, Biological Scien (Dr B D Russell, Biological Scien This course will introduce the fu they provide human populatior including financial, cultural, soci how human activities degrade increase the ecosystem services Natural ecosystems provide trilli services go unrecognized and u may be priceless. This course w marine environments. Students to human populations. Finally, h can provide these services, and independent and creative thinki inherent properties rather than p On successful completion of this CLO 1 Demonstrate an underst CLO 2 Explain how ecosystems CLO 3 Demonstrate knowledge CLO 4 Demonstrate knowledge CLO 5 Demonstrate an unders ecosystem services Pass in one of the following of Evidence of a thorough gr familiarity with relevant ba skills. Ample evidence of comparative perspective presentation skills with explevel. B Evidence of a good grasp with relevant background	Dr B D Russell, Biological Sciences (brussell@hku.hk) (Dr B D Russell,Biological Sciences) This course will introduce the functioning of terrestrial, fresh water they provide human populations. The concept of ecosystem se including financial, cultural, social and, importantly, the intrinsic va how human activities degrade these ecosystem services and ho increase the ecosystem services supplied to humans. Natural ecosystems provide trillions of dollars' worth of ecosystem services go unrecognized and undervalued. In fact, because humany be priceless. This course will first cover the function of differemarine environments. Students will then be introduced to the conce to human populations. Finally, human activities which degrade ecosycan provide these services, and what that means for human populations to the inherent properties rather than perceived monetary value. On successful completion of this course, students should be able to CLO 1 Demonstrate an understanding of the complexity and function CLO 2 Explain how ecosystems provide services which humans used CLO 3 Demonstrate knowledge on methods used to calculate the value of the complexity and function CLO 5 Demonstrate knowledge on the limits to the methods used dangers of placing a value on nature CLO 5 Demonstrate an understanding of how human activities referoly becomes a placing a value on nature. CLO 5 Demonstrate an understanding of how human activities referoly becomes a placing a value on nature. CLO 5 Demonstrate an understanding of how human activities referoly becomes a placing a value on nature. CLO 6 Demonstrate and provide reading and case studies. Exemply skills. Ample evidence of independent critical thought with excellent used to comparative perspective to draw insightful and logical conclusions. presentation skills with excellent analytical argumentation. Excellent level. B Evidence of a good grasp of the subject and relevant research techn with relevant background reading and case studies. Good handling Good evidence of critical t	Dr B D Russell, Biological Sciences (brussell@hku.hk) (Dr B D Russell,Biological Sciences) This course will introduce the functioning of terrestrial, fresh water and marine ecosystems and they provide human populations. The concept of ecosystem services will be further expincluding financial, cultural, social and, importantly, the intrinsic value that may be priceless. Now human activities degrade these ecosystem services and how protecting ecosystems increase the ecosystem services supplied to humans. Natural ecosystems provide trillions of dollars' worth of ecosystem services to humans every services go unrecognized and undervalued. In fact, because humans rely on ecosystems main may be priceless. This course will first cover the function of different ecosystems from terrest marine environments. Students will then be introduced to the concept of ecosystems rom terrest marine environments. Students will then be introduced to the concept of ecosystems ervices at o human populations. Finally, human activities which degrade ecosystems and reduce the ext can provide these services, and what that means for human populations, will be covered. S independent and creative thinking when proposing solutions to the question of how to value of inherent properties rather than perceived monetary value. On successful completion of this course, students should be able to: CLO 1 Demonstrate an understanding of the complexity and function of ecosystems CLO 2 Explain how ecosystems provide services which humans use CLO 3 Demonstrate knowledge on methods used to calculate the value of ecosystem services and properties rather than perceived monetary value. CLO 5 Demonstrate knowledge on the limits to the methods used to calculate the value of edangers of placing a value on nature CLO 5 Demonstrate an understanding of how human activities reduce the function of ecosy ecosystem services Pass in one of the following courses: BIOL3301 or BIOL3303 or BIOL3313 or BIOL3313 envisable presentation skills with excellent analytical a		

BIOL4401	Medical microbiology and applied immunology (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	40
Course Co-ordinator	Dr W Y Lui, Biological Sciences (wylui@hku.hk)		
Teachers Involved	(Dr A Yan,Biological Sciences) (Dr C G Zheng,Biological Sciences) (Dr W Y Lui,Biological Sciences)		
Course Objectives	The objective is to provide students the knowledge on the practical application biological research, clinical analysis and disease diagnosis.	ns of immunology ar	d microbiology in
Course Contents	Application of antigen-antibody interaction in advanced research such as ch	romatin. immunopred	ipation assay, co-

& Topics	immunoprecipitation and dual immunofluorescence analysis. Principles of flow cytometry and its application. Tumor immunology and immunotherapy such as FDA-approved checkpoint inhibitor immunotherapy and chimericantigen receptor (CAR) T-cell therapy. Microbial pathogens and associated diseases, host immune response, antimicrobial agents and multidrug resistance, epidemiology and prevention of microbial infections. Clinical laboratory analysis in haematology, chemical pathology, and clinical microbiology. The application of these testing methods in the diagnosis of disease associated with major systems of the human body and the diagnosis of infectious diseases.					
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 apply the principles of antigen-antibody interaction in various advanced research techniques CLO 2 demonstrate knowledge on microbial pathogens, mechanisms for their disease-causing, and principles of antibiotic development.					
		ntibiotic development Inderstand the scientific p	rinciples of various clin	nical laboratory a	analyses	
					•	istance
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Bl	CLO 4 promote public attention on control of microbial infection and the spread of antibiotic resistance Pass in BIOL3401				
Offer in 2020 - 2021	Y 2nd	I sem Offer in 2021 - 2	022 : Y		Examination	May
Grade Descriptors (A+ to F)	A	outcomes. Show strong and knowledge to a wide range	alytical and critical abilities ar of complex, familiar and unfa	nd logical thinking, amiliar situations. A	edge required for attaining with evidence of original thou oply highly effective lab skills oly highly effective organizat	ught, and ability to apply and techniques. Critical
	B Demonstrate substantial command of a broad range of knowledge required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	D					
	Fail Demonstrate little or no evidence of command of knowledge required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture w	ith laboratory componen	t course			
Course Teaching	Activities	3	Details			No. of Hours
& Learning Activities	Lectures					24
	Laborator	У				20
	Tutorials	10-lf-4				6
A		Self study	—			100
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Examinat				50	CLO 1,2,3
	Laborator	y reports			30	CLO 1,2,3
Required/recommended reading and online materials	Test To be ann	ounced in class			20	CLO 1,2,3
Course Website	http://moo	dle.hku.hk/				
Additional Course		se will be offered subject	to a minimum enrollme	ent number and	availability of teachers	
Information		•			•	

BIOL4402	Microbial biotechnology (6 credits)	Academic Year	2020			
Offering Department	Biological Sciences	Quota	30			
Course Co-ordinator	, Biological Sciences ()					
Teachers Involved	(,Biological Sciences)					
Course Objectives	This course is intended for students who would like to understand the app biotechnology. The microbial systems being used include different types of vir the end of the course the students are expected to know the parameters and production and the systems available for the expression of vaious types of biote	uses, bacteria, fur d conditions that a	ngi and algae. At affect the yield of			
Course Contents & Topics	Upstream and downstream processing will be briefly described to equip the microbial biotechnology. The latest advances in microbial expression systems algae will be reviewed. Specific examples on the use of these systems will be limited to production of recombinant vaccines, secondary metabolites, food and biopesticides as well as bioremediation and medical diagnostics.	using viruses, bac e provided. Thes	cteria, yeasts and e include but not			
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 explain the fundamental biochemical concepts underlying the industrial production of selected microbial biotechnology products					
	CLO 2 understand the importance of the current recombinant technology for large-scale manufacturing of various protein products					
	CLO 3 describe the major expression systems, understand their purposes, advantages, and disadvantages					
	CLO 4 deliver a professional group presentation on a self-decided topic related	to microbial bioted	chnology			
Pre-requisites (and Co-requisites and Impermissible	Pass in BIOL3401					

Offer in 2020 - 2021	N Off	er in 2021 - 2022 : N		Examination		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Demonstrate deep understanding of the subject. Demonstrate integration of the full range of appropriate theories, principles, evidence and techniques. Illustrate insightful use and critical analysis / evaluation of information drawn from a full range of high quality sources and to quote/reference aptly. Apply highly effective organizational and presentational skills.					
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining most of the course learning outcomes. Demonstrate substantial grasp of the subject. Demonstrate general integration of theories, principles, evidence and techniques. Illustrate critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly. Apply effective organizational and presentational skills.					
	С					
	D	limited grasp, with reter and techniques. Demo	ition of some relevant information, of	ing some of the course learning outcomes, the subject. Show limited integration of thec al sources, but mainly through summary r nd presentational skills.	ries, principles, evidence	
	Fail	or no grasp of the kno evidence and technique	wledge and understanding of the su	aining the course learning outcomes. Demi ibject. Show little or no or inapt integration or sources and no critical comparison of	n of theories, principles,	
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	5	Details	No. of Hours		
& Learning Activities	Lectures					
	Tutorials		including group presentat	including group presentations		
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents		30	CLO 1,2,3,4	
	Examinat	ion		70	CLO 1,2,3	
Required/recommended	A. N. Gla	zer and H. Nikaido:	Microbial Biotechnology: Fun	damentals of Applied Microbiology	(W. H. Freeman &	
reading and	Co., 1995		3,	3,	•	
	A I Dom	ain I F Davies R	M Atlas G Cohen C I Her	shherger W-S Hu D		
online materials	A. L. Delli	L. Demain, J. E. Davies, R. M. Atlas, G. Cohen, C. L. Hershberger, W-S. Hu, D. p://moodle.hku.hk/				

Biological Sciences Or W B L Lim, Biological Sciences <i>(bllim@hku</i> .	Quota	30		
, ,				
	.hk)			
Dr W B Lim, School of Biological Sceinces)				
najor viral diseases that affect animal health. virology, medicine and biotechnology.	les of virology so that students can understand the The course will prepare students for profession or			
Classification and Nomenclature of Viruses Virus structure: Capsid symmetry, Icosahedi Virus structure: Genetic Materials, Nucleoca Virus entry: Receptors, uncoating and fusior Virus-Cell interaction RNA viruses: Genome replication and mRNA Baltimore Class IV (+) s.s. RNA viruses: Pica Baltimore Class V (-) s.s. RNA viruses: Myxo Ambisense RNA viruses: Bunyaviruses and 0, 11. Baltimore Class VI (+) s.s. RNA viruses: Reovi 3, 14. Baltimore Class II d.s. RNA viruses: Reovi 3, 14. Baltimore Class II s.s. (+) DNA viruses: Pai 6. Mechanisms of Viral Oncogenesis 17. Anti-viral treatments 18. Viruses as Tools in Medicine and Biotechnic Practical Virology 19. Specimen Collection, Transportation and Pouality Assurance & Laboratory Safety 20. Virus isolation, propagation and titration 21, 22. Virus Identification: Immunocytochemic Complement Fixation Assay, Hemagglutinatior	psid, Envelope A production cornaviruses coviruses Arenaviruses s: Retroviruses ruses enoviruses, Herpesviruses rvoviruses cology drocessing, and All assays			
On successful completion of this course, students should be able to: CLO 1 be familiar with virus classification and the modes of replication and transmission of various viral families CLO 2 gain hand-on experiences on common virological techniques				
Pass in BIOL3401 or BIOL3403				
	Examination	To be confirmed		
strong analytical skills and competent ability	to acquire knowledge on new development of the subject. App			
B Demonstrate substantial command of a bro learning outcomes. Show evidence of anal	oad range of knowledge and skills required for attaining at lea ytical skills and adequate ability to acquire knowledge on nev			
F123456789111111 F1C22C2C	Fundamental Virology 1. Classification and Nomenclature of Viruses 2. Virus structure: Capsid symmetry, Icosahedi 3. Virus structure: Genetic Materials, Nucleoca 4. Virus entry: Receptors, uncoating and fusior 5. Virus-Cell interaction 6. RNA viruses: Genome replication and mRN/ 7. Baltimore Class IV (+) s.s. RNA viruses: Pice 8. Baltimore Class V (-) s.s. RNA viruses: Myx 9. Ambisense RNA viruses: Bunyaviruses and 10, 11. Baltimore Class VI (+) s.s. RNA viruses: Rev 12. Baltimore Class III d.s. RNA viruses: Rev 13. 14. Baltimore Class II d.s. DNA viruses: Par 16. Mechanisms of Viral Oncogenesis 17. Anti-viral treatments 18. Viruses as Tools in Medicine and Biotechn Practical Virology 19. Specimen Collection, Transportation and P Quality Assurance & Laboratory Safety 20. Virus isolation, propagation and titration 21, 22. Virus Identification: Immunocytochemic Complement Fixation Assay, Hemagglutinatior 23, 24. Neutralization assay and Antiviral assa On successful completion of this course, stude CLO 1 be familiar with virus classification and CLO 2 gain hand-on experiences on common CLO 3 carry out researches on virology after the Pass in BIOL3401 or BIOL3403 Y 1st sem Offer in 2021 - 2022: N A Demonstrate thorough mastery at an advanstrong analytical skills and competent ability skills and techniques. Apply highly effective B Demonstrate substantial command of a brelarning outcomes. Show evidence of anal subject. Apply effective lab skills and technic	Fundamental Virology 1. Classification and Nomenclature of Viruses 2. Virus structure: Capsid symmetry, Icosahedral symmetry 3. Virus structure: Genetic Materials, Nucleocapsid, Envelope 4. Virus entry: Receptors, uncoating and fusion 5. Virus-Cell interaction 6. RNA viruses: Genome replication and mRNA production 7. Baltimore Class IV (+) s.s. RNA viruses: Picornaviruses 8. Baltimore Class IV (+) s.s. RNA viruses: Myxoviruses 9. Ambisense RNA viruses: Bunyaviruses and Arenaviruses 10, 11. Baltimore Class II d.s. RNA viruses: Retroviruses 11. Baltimore Class II d.s. RNA viruses: Retroviruses 12. Baltimore Class II d.s. DNA viruses: Reviruses 13. 14. Baltimore Class II d.s. DNA viruses: Parvoviruses 15. Baltimore Class II s.s. (+) DNA viruses: Parvoviruses 16. Mechanisms of Viral Oncogenesis 17. Anti-viral treatments 18. Viruses as Tools in Medicine and Biotechnology Practical Virology 19. Specimen Collection, Transportation and Processing, Quality Assurance & Laboratory Safety 20. Virus isolation, propagation and titration 21, 22. Virus Identification: Immunocytochemical assays, ELISA, Complement Fixation Assay, Hemagglutination and HI assays 23, 24. Neutralization assay and Antiviral assay On successful completion of this course, students should be able to: CLO 1 be familiar with virus classification and the modes of replication and transmission of varior CLO 2 gain hand-on experiences on common virological techniques Pass in BIOL3401 or BIOL3403 T st sem Offer in 2021 - 2022: N Demonstrate thorough mastery at an advanced level of knowledge required for attaining all the course lear strong analytical skills and competent ability to acquire knowledge on new development of the subject. Apply skills and competent ability to acquire knowledge on new development of the subject. Apply skills and competent ability to require for attaining all telearning outcomes. Show evidence of analytical skills and adequate ability to acquire knowledge on new subject. Apply effective to sylanizational		

		outcomes. Show evidence of some analytical skills and certain ability to acquire knowledge on new development of the subject. Apply moderately effective lab skills and techniques. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of limited analytical skills and ability to acquire knowledge on new development of the subject. Apply partially effective lab skills and techniques. Apply limited or barely effective organizational and presentational skills.				
	Fail	of analytical skills and abi	ility to acquire knowledge or	owledge and skills required for attaining the course in new development of the subject. Apply minimally al skills are minimally effective or ineffective.		
Course Type	Lecture v	vith laboratory compone	ent course			
Course Teaching	Activitie	es	Details		No. of Hours	
& Learning Activities	Lectures	,			24	
	Laboratory				24	
	Tutorials				6	
	Reading / Self study					
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examina	ation		80	CLO 1,2,3	
	Laborato	ory reports		20	CLO 1,2,3	
Required/recommended reading and online materials	Principles	Virology: Molecular Biology and pathogenesis (2010) L. C. Norkin, ASM Press. Principles of Virology (2009) S.J. Flint, ASM Press. Basic Virology (2008) E.K. Wagner. Blackwell.				
Course Website	http://mo	odle.hku.hk/				
Additional Course	Offer in a	alternate year from 2017	7-2018			
Information	This cour	rse will be offered subje	ect to a minimum enrol	Iment number and availability of teachers	S.	

BIOL4411	Plant ar	nd food biotechnolog	gy (6 credits)	Academic Year	2020	
Offering Department	Biologica	al Sciences		Quota	60	
Course Co-ordinator	Prof M L	Chye, Biological Science	es (mlchye@hku.hk)			
Teachers Involved	(mlchye@	@hku.hk,Biological Scienc	ces)			
Course Objectives	This course covers the principles and key concepts of plant and food biotechnology and its applications in increasing global food supply. The significances of biotechnology in agriculture and food production, and the emerging importance of plant biotechnology in molecular farming for the production of biopharmaceuticals and other high-value proteins will be discussed. The course will also provide an insight on the real-life applications of plant and food biotechnology.					
Course Contents & Topics	 Genetic improvements in agriculture. Transgenic crops in global food production. Tools in plant genetic engineering: promoters and marker genes. Techniques in plant gene transfer: Agrobacterium-mediated transformation, biolistics and microinjection. Nuclear and plastid transformation. Gene silencing in plants. Genetic manipulation of commercially useful biosynthetic pathways in crops. Extending shelf-life of fruits. Prevention of enzymatic browning of potato tubers. Genetically-engineered biofortified foods: provitamin A-enriched rice, omega-3-enriched soy and hanthocyanin tomatoes. Biotechnology in plant pest and disease management: Producing crops resistant to phytopathogens and pests. Short-interfering RNAs in gene silencing to defend against plant viruses. Protecting crops in the field using the Bt toxin. Pest-resistant genetically-transformed seeds using the alpha-amylase inhibitor Herbicide-resistant crops. Plants as bioreactors for molecular farming: transgenic and transplastomic plants for producing recombin biopharmaceutical proteins. Biodegradable plastics. Biofuels. Genetically-modified crops and food products: regulation, testing and labelling. 					
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 acquire key concepts in plant and food biotechnology and basic laboratory techniques in plant biotechnology					
	CLO 2 gain insight into real-life applications in plant and food biotechnology					
		develop scientific inquiry a	and critical thinking skills			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	BIOL3211 or BIOL3401				
Offer in 2020 - 2021	Y 1st	st sem Offer in 2021 - 20	022 · Y	Examination	Dec	
Grade Descriptors (A+ to F)	A Demonstrate thorough and complete mastery of extensive knowledge and skills required for attaining the learning outcomes in Plant and Food Biotechnology. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations in plant biotechnology. Apply highly effective organizational and presentational skills.					
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes in plant biotechnology. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but in outcomes. Show evidence of familiar situations. Show mo	ncomplete command of knowledge and of some analytical and critical abilities a oderately effective organizational and pre	d skills required for attaining most of and logical thinking, and ability to appl sentational skills.	the course learning y knowledge to most	
	D	Demonstrate general but in outcomes. Show evidence of familiar situations. Show mo Demonstrate partial but limit Some evidence of coherent apply knowledge in plant bic	ncomplete command of knowledge and of some analytical and critical abilities a detrately effective organizational and pre- ited command of knowledge and skills re t and logical thinking, accompanied with otechnology. Show limited or barely effective to the command of the	d skills required for attaining most of and logical thinking, and ability to appl sentational skills. equired for attaining some of the cours in limited analytical and critical skills. S tive organizational and presentational s	the course learning y knowledge to most be learning outcomes. Show limited ability to kills.	
		Demonstrate general but in outcomes. Show evidence of familiar situations. Show mo Demonstrate partial but limi Some evidence of coherent apply knowledge in plant bio Fail to demonstrate commar	ncomplete command of knowledge and of some analytical and critical abilities a derately effective organizational and pre ited command of knowledge and skills rut and logical thinking, accompanied with otechnology. Show limited or barely effect do of knowledge and skills required for a locherent thinking. No evidence in ability	d skills required for attaining most of and logical thinking, and ability to appl sentational skills. equired for attaining some of the cours in limited analytical and critical skills. S tive organizational and presentational s ttaining the course learning outcomes.	the course learning y knowledge to most be learning outcomes. show limited ability to kills. Lack of analytical and	
Course Type	D Fail	Demonstrate general but in outcomes. Show evidence of familiar situations. Show mo Demonstrate partial but limit Some evidence of coherent apply knowledge in plant bic Fail to demonstrate commar critical abilities, logical and	ncomplete command of knowledge and of some analytical and critical abilities a derately effective organizational and pre ited command of knowledge and skills ret and logical thinking, accompanied with technology. Show limited or barely effect of of knowledge and skills required for a coherent thinking. No evidence in abilitional skills.	d skills required for attaining most of and logical thinking, and ability to appl sentational skills. equired for attaining some of the cours in limited analytical and critical skills. S tive organizational and presentational s ttaining the course learning outcomes.	the course learning y knowledge to most be learning outcomes. show limited ability to kills. Lack of analytical and	
Course Type Course Teaching	D Fail	Demonstrate general but in outcomes. Show evidence of familiar situations. Show mo Demonstrate partial but limit Some evidence of coherent apply knowledge in plant bic Fail to demonstrate commar critical abilities, logical and organizational and presental with laboratory componen	ncomplete command of knowledge and of some analytical and critical abilities a derately effective organizational and pre ited command of knowledge and skills ret and logical thinking, accompanied with technology. Show limited or barely effect of of knowledge and skills required for a coherent thinking. No evidence in abilitional skills.	d skills required for attaining most of and logical thinking, and ability to appl sentational skills. equired for attaining some of the cours in limited analytical and critical skills. S tive organizational and presentational s ttaining the course learning outcomes.	the course learning y knowledge to most be learning outcomes. show limited ability to kills. Lack of analytical and	

	Laboratory	practical/laboratory/pro	pject	30
	Reading / Self study			100
Assessment Methods and Weighting	Methods	Details Weighting in final course grade (%)		Assessment Methods to CLO Mapping
	Examination		50	CLO 1,2,3
	Laboratory reports		10	CLO 1,2,3
	Presentation		20	CLO 1,2,3
	Test		20	CLO 1,2,3
Required/recommended reading and online materials	E-reserves (HKU Library)	. Plants, genes, and agr	iculture. Jones and Bartlett.	
	Lecture notes on Moodle			
Course Website	http://moodle.hku.hk/			
Additional Course	Core in Molecular Biology & Biote	chnology Major		
Information	An advanced elective course in FI	NS Major		
	An advanced elective course in Pl	ant Science Minor		

BIOL4415	Healthca	are biotechnology	y (6 credits)	Academic Yea	ar 2020	
Offering Department	Biological		, ()	Quota	70	
Course Co-ordinator	Prof A S T	Wong, Biological Sc	ciences (awong1@hku.hk)	·		
Teachers Involved	(Dr K W Y Yuen, Biological Sciences) (Prof A S T Wong, Biological Sciences)					
Course Objectives	This course discusses the key concepts and principles involved in healthcare biotechnology, and their applications in molecular medicine.					
Course Contents & Topics	Genetic bi	iotechnology in anim the study of human	als (transgenics, knockouts and diseases, as bioreactors for the			
	and organs for xenotransplantation. Advanced molecular biology techniques related to human and animal science basic research, disease dia and development of new therapies. These include but not limited to: applications of DNA technologies in dia medicine and forensic science; tissue engineering. An overview of the drug development process, with a focus on the early-stage, preclinical drug discover target identification, high-throughput assay development, and screening of chemical libraries (synthetic and					
		· •	ridualized medicine will also be dis			
Course Learning			is course, students should be able			
Outcomes		•	in genetic biotechnology and hum			
			anced laboratory techniques esse	••		
		evelop scientific inqui develop solutions	ry and critical thinking skills to un	derstand, analyze, and evaluate	e problems in orde	
			orld applications in healthcare bio	technology		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BI	OL3401				
Offer in 2020 - 2021	Y 2nd	I sem Offer in 2021	2022 · V	Examination	May	
Grade Descriptors	A 2110					
(A+ to F)	Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to appl knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational skills. Writing consistently demonstrate informed, thoughtful intellectual engagement with broad range of relevant concepts.					
	В	outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational skills. Writings mostly demonstrate informed, thoughtful intellectual engagement with broad range of relevant concepts.				
	С	Demonstrate general but incomplete command of knowledge required for attaining most of the course learning outcomes. Sho evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations Apply moderately effective organizational skills. Writings mostly indicate informed, intellectual engagement with concepts of theories but not always with sufficient depth, breadth or understanding.				
	D	evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to appl knowledge to solve problems. Apply limited or barely effective organizational skills. Writings indicate some intellectual engagement with concepts or theories but mostly at a superficial level.				
	Fail Demonstrate little or no evidence of command of knowledge required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems Organizational skills are minimally effective or ineffective. Writings reveal an absence of intellectual engagement with concept or theories. Writings are irrelevant or superficial.					
Course Type	Lecture wi	ith laboratory compor	nent course			
Course Teaching	Activities	•	Details		No. of Hours	
& Learning Activities	Lectures					
=	Laborator	У			24 24	
	Tutorials	•	tutorials/assignments/computer sessions		6	
		Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents		10	CLO 1,3,4	
	Examinat			50	CLO 1,3,4	
	Laborator			20	CLO 1,2,3,4	
	Test	, .le		20	CLO 1,3	
Required/recommended		of Drug Design and	Discovery (Krogsgaard-Larsen, L			
					a.ioio, 2002)	
			Strachan and Read, Garland Scie	100, 2010)		
reading and online materials	- Suggeste	ed readings for each	topic will be provided.	nce, 2010)		
	- Suggeste			ice, 2010)		

Information

BIOL4416	Stem cells and regenerative b		e biology (6 credits)	Academic Yea		
Offering Department	Biological			Quota	40	
Course Co-ordinator		Yuen, Biological Scienc				
Teachers Involved	١, ٠	u Zheng,Biological Scie	ences)			
	,	ng,Biological Sciences)	200)			
Course Objectives		Yuen, Biological Science	es) anding in regenerative biology, a	aging and longevity at the cell	ular and molecula	
course objectives			nection between these biological		ulai allu Illolecula	
Course Contents		e will discuss cutting-ed	5	evente.		
& Topics		rative and stem cell biok	· ·			
•	١,, ٥	characteristics of stem	0,			
	- the mole	cular and genetic contro	ol of cell fate specification and di	fferentiation		
		ic and adult stem cells				
			nt stem cells and tissue enginee	ring		
		itics potentials for stem on sues in stem cell resear	0,			
		and longevity:	CIT			
	.,	stems used for aging a	nd life-span studies			
		and molecular biology of				
		s and cellular senescen				
	_	stability, DNA mutations				
		ndrial defects and oxidat	tive stress			
		aging diseases biochemical and metabo	olic pathways involved in longev	itv		
Course Learning			course, students should be able	•		
Outcomes			regulations of cell potency, cell a			
		• • • • • • • • • • • • • • • • • • • •	tics of stem cells and the differen			
			stem cell research, and underst			
	CLO 4	describe the cellular me	chanisms of aging, and the path	ways involved in longevity		
Pre-requisites	Pass in BI	OC3601 or BIOC3604 of	or BIOL3211 or BIOL3401 or BIO	DL3402 or BIOL3403 or BIOL34	404 or BIOL3408	
(and Co-requisites						
and Impermissible						
combinations)		0" : 0004	2000			
Offer in 2020 - 2021		sem Offer in 2021 - 2		Examination	May	
Grade Descriptors (A+ to F)	Α		complete mastery at an advanced level Show strong analytical and critical abiliti			
(A. 101)		course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and				
	presentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course					
	D					
	В	Demonstrate substantial co		and skills required for attaining at lea	ast most of the course	
		Demonstrate substantial co learning outcomes. Evidence some unfamiliar situations.	ommand of a broad range of knowledge be of analytical and critical abilities and l Apply effective organizational and prese	e and skills required for attaining at lea ogical thinking, and ability to apply kno ntational skills.	ast most of the course owledge to familiar and	
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BIOL4417	'Omics' and systems biology (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	40
Course Co-ordinator	Dr J W Zhang, Biological Sciences (jzhang1 @hku.hk)		

Teachers Involved	(Dr J W Zhang,Biological Sciences)					
Course Objectives	Recent progress in high-throughput omics technology has revolutionized the biological research. Genome-wide profiling of various biomolecules simultaneously by omics technology generates huge amounts of data, providing the potential to obtain a global and holistic view of the system. This course aims to introduce the technologies of Omics and Systems Biology, and overview of various applications of omics technology. Synthetic biology is set to be the heart of future economy, promising to create new drugs, industrial materials and energy sources similar to chemical synthesis. The significance of this field has been promoted by the worldwide synthetic biology competition organized by MIT, i.e., iGEM competition. In this course, we will introduce some innovative ideas in synthetic biology and practice the skills needed for iGEM competition.					
Course Contents & Topics	The course covers various OMICS techniques with special focus on sequence alignment, next generation sequencing, computational modeling, and statistic programming. This course will also provide students hands-on experience in large scale data analysis, and experiment methodologies involved in: Systems biology and functional genomics - the study of the interactome/network between components of a biological system, and modeling to discover the integrated function and emergent properties of that system; Synthetic biology- the design and building of synthetic protocells using basic biochemical building blocks from scratch.					
Course Learning Outcomes	CLO 1 ex ap CLO 2 de CLO 3 de CLO 4 de sy	On successful completion of this course, students should be able to: CLO 1 explain the conceptual differences between 'Omics'/Systems Biology studies and traditional one-gene approach, and discuss the pros and cons of both approaches CLO 2 describe common methodologies used in iGEM and Synthetic biology CLO 3 describe basic analytical methods, and access database resources generated in major 'Omics' studies CLO 4 describe how 'Omics' data are used in Systems Biology to understand the integrated functions of the system				
Pre-requisites (and Co-requisites and Impermissible combinations)	CLO 5 identify questions that can be addressed by 'Omics' and Synthetic Biology studies Pass in BIOC3601 or BIOC3604 or BIOL3211 or BIOL3401 or BIOL3402 or BIOL3403 or BIOL3404 or BIOL3404					
Offer in 2020 - 2021	Y 2nd	l sem Offer in 2021 -	· 2022 : Y	Examination	May	
Grade Descriptors (A+ to F)	A Demonstrate thorough and complete mastery at an advanced level of extensive knowledge and skills required for attaining course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thoug ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organization presentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the learning outcomes. Evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to family some unfamiliar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course leaves outcomes. Evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most situations. Apply moderately effective organizational and presentational skills. D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning out Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcome of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to				ce of original thought, and fective organizational and	
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BIOL4451	Cetacean behaviour, ecology and conservation: field research experience (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	12
Course Co-ordinator	, Biological Sciences ()		
Teachers Involved			
Course Objectives	This course offers an exciting experiential learning opportunity through hands-obehavioural ecology and conservation of free-ranging cetaceans (whales, do students with a fundamental knowledge, skills, and the appreciation of what effectively run field studies in cetacean ecology, behaviour and conservation, armobile marine vertebrates.	lphins and porpoi t takes to design	ses). It provides , implement, and
Course Contents & Topics	Field-based studies of cetaceans have been rapidly evolving in recent yea developments that allow researchers to tackle previously unexplored avenues component of cetacean studies, the direct contact with free-ranging animals out and on their terms remains unchanged; both challenging and fascinating. research site outside Hong Kong, will expose students to various aspects of definition of a research question to project design, and to various stages of data will learn a suite of research techniques, and will exercise their skills in data emphasis will be on delphinid behavioural ecology and conservation application the scientific reasoning and methodology, and will develop an understanding ho to advancing science and benefiting broader conservation management efforts.	of research. How at sea, in their na This course, cond cetacean field sea collection and ar processing and in se, students will be windividual projec	ever, the primary tural environment ducted in a field studies, from the nalyses. Students iterpretation. The e guided through cts can contribute

	extensive field-based	field component with s	research and recent discoveries, reviesea-based research surveys performere required to write an independent re	ed daily (weather permit	ting). Following the	
Carres I samina	course.	aful aguardation of this	animan atridanta abarild ba abla tar			
Course Learning Outcomes		•	course, students should be able to:	ctom ctudiod		
Outcomes			rsity and primary habitats in the ecosy needed to identify target species assoc		20	
			t and able to implement sampling to			
		osystems studied	t and able to implement sampling to	confidues for organism	s in the particular	
			logy of target species and how biotic a	and abiotic factors shape	focal communities	
Pre-requisites			ng courses: BIOL3101, BIOL3301, BIO		Toodi oommuuu	
(and Co-requisites and Impermissible	This experimental The earlier	riential field course is post that a student is a	rimarily for Ecology & Biodiversity Majo llowed to take this experiential cours	or students.	; and because it is	
combinations) Offer in 2020 - 2021		er in 2021 - 2022 : N	rse is best suited for year 3 students.	Evamination		
			sp of the subject and relevant research techniq	Examination	m to loarn and availlant	
Grade Descriptors (A+ to F)	Α	familiarity with relevant bac skills. Ample evidence of in comparative perspective to	keyorund reading and case studies. Exemplary hadependent critical thought with excellent use of draw insightful and logical conclusions. Showellent analytical argumentation. Excellent or or	nandling of field data collectior f a broad range of fundament v outstanding abilities of inde	and excellent analytical all concepts and broader ependent work, effective	
	В	with relevant background of Good evidence of critical consideration of broader consideration of	of the subject and relevant research techniques reading and case studies. Good handling of fie thought (although not always independent), wi omparative perspective in drawing logical conc cal and analytical argumentation. Work more the	eld data collection and comme ith an appreciable use of fun lusions. Good abilities of inde	endable analytical skills. damental concepts and ependent work, effective	
	С	presentation skills with logical and analytical argumentation. Work more than sufficient for what is required at degree level. Demonstrate an adequate, but incomplete grasp of the subject and relevant research techniques. Moderate familiarity with relevant background reading and case studies, but no interest in learning beyond the adequate average level. Evidence of logical critical thinking (although not always independent), with mostly good use of fundamental concepts to draw logical conclusions. Fair presentation skills, with mostly correct argumentation, but limited (or no) abilities to integrate broader concepts. Work				
	sufficient for what is required for degree level. Demonstrate some grasp of the subject, but only partial and with limited understanding of relevant research concepts and research techniques. Some familiarity with relevant case studies, but insufficient evidence of background reading and limited abilities of critical independent thinking. Ineffective presentation skills with generally weak logical argumentation with restricted ability of drawing appropriate conclusions. Work barely meets what is required at degree level.					
	Fail No evidence of basic a minimum grasp of the subject and the minimum relevant research techniques. No evidence of background reading and no familiarity with any relevant examples and case studies. Inadequate evidence of coherent logical thought; ineffective presentation skills with poor argumentation and no abilities to draw meaningful conclusions. Work fails to reach degree level.					
Course Type	Field camp	os				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures		lectures and tutorials		12	
	Field work	(80	
	Presentat	ion	interactive debates		10	
	Reading /	Self study			100	
	Assessme	ent	group projects		12	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	nts		35	CLO 1,2,3,4	
	Report		project report (35%), group investigation & presenation (30%)	65	CLO 1,2,3,4	
reading and online materials	whales. C Boyd, I.L., Technique	chicago University Pres Bowen, W.D., Iversor es. Oxford University P	n, S.J. (eds). 2010. Marine Mammal ress.			
Course Website		.biosch.hku.hk/ecology	//lsc/			
Additional Course Information	The cours submit a b not later th 1. Persona 2. ID photo 3. Brief de	rief (maximum 1-page) nan 10th January. The al and academic details				
	GPA Fre-requisite courses taken and grades received (if pre-requisites are not met, a reasoned request for waiver) All applications will be reviewed prior to the commencement of the 2nd semester and results will be announced within the 1st week of the add/drop period of the 2nd semester.					

BIOL4501	Molecular phylogenetics and evolution (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	25
Course Co-ordinator	TBC, Biological Sciences ()	'	
Teachers Involved	(TBC,Biological Sciences)		
Course Objectives	The purpose of this course is to provide a comprehensive overview of state phylogenetic research, focusing on in depth coverage of the latest technique in formal lectures is coupled with practical workshops. - acquisition of the sequences from the databases - DNA and protein sequence assembly and alignment - phylogeny reconstruction using parsimony, distance based, and maximum I - introduction to relevant software for phylogenetics - methods for the evaluation of phylogene trees	s. The treatment of	theoretical issues
Course Contents & Topics	Introduction to molecular systematics and phylogenetics. Tree of life. Obtain and tissue samples for use in molecular studies. Sources of molecular dat studies, taxon sampling and marker choice. Overview of basic laboratory isolation, PCR, DNA sequencing). Sequence editing and aligning; utilizing pure sequence.	a, experimental des methods for data	ign for molecular collection (DNA

			diversity. Methods for phy			
	maximum likelihood, Bayesian methods. Statistical methods for the evaluation of phylogenetic trees. Software for					
	phylogeny reconstruction. Molecular markers in conservation and ecological genetics. Phylogenies					
Course Learning		organisms. Biogeography vs. phylogeography using molecular data. On successful completion of this course, students should be able to:				
Outcomes		•	ital principles of molecular i			
Jutcomes			each method is used for a		se the most an	nronriate method(s)
		or the analysis of given d		ind be able to choo	oc the most ap	propriate metrod(s)
			es and disadvantages of the			
	CLO 4 a	cquire practical skills for	the analysis of molecular of	lata		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	BIOL3401 or BIOL3408				
Offer in 2020 - 2021	N Of	fer in 2021 - 2022 : N			Examination	
Grade Descriptors (A+ to F)	A	learning outcomes of the capply the relevant theories methods and software for	ve knowledge and an advanced course. Show deep understandin, , principles, and methods taught evolutionary analysis of real da sources and to quote them appro	g of the course subject. in the course. Advanced ta. Excellent ability to	Excellent ability to d skills in possessi- collect, systematiz	o efficiently combine and on and application of the
	В					
	C Demonstrate basic knowledge and basic level of skills sufficient for accomplishing most of the goals and expected learning outcomes of the course. Demonstrate general understanding of the subject. Show some ability to combine and to apply theories, principles and methods taught in the course. Basic skills in possession and application of the methods and software for molecular evolutionary analysis of real data. Show general ability to collect, systematize, analyze and evaluate data from various					
	sources and to quote them appropriately. Basic presentational skills.					
	D Demonstrate incomplete knowledge and weak skills sufficient for accomplishing only some of the goals and expected learning					
		outcomes of the course. Demonstrate poor understanding of the subject, Show poor ability to combine and to apply theories, principles, and methods taught in the course. Limited skills in possession and application of the methods and software for molecular evolutionary analysis of real data. Show poor ability to collect data from various sources, to systematize, analyze and subject the contractions of the course of the				
	Fail	evaluate them appropriately. Poor presentational skills. Demonstrate poor or no knowledge and skills required for accomplishing the goals and expected learning outcomes of the				
	course. Demonstrate very poor or no understanding of the subject. Show no ability to combine and/or to apply theories, principles, and methods taught in the course. Poor or no skills in possession and application of the methods and software for molecular evolutionary analysis of real data. Show very poor or no ability to collect data from other sources and to systematize, analyze and evaluate them appropriately. Very poor or no presentational skills.					
Course Type	Lecture v	vith laboratory componer				
Course Teaching	Activitie		Details			No. of Hours
Learning Activities	Lectures	 				24
-	Laborato		computer laboratory/tutor	computer laboratory/tutorial/projects		36
		/ Self study	1	' '		100
Assessment Methods and Weighting	Methods	, S	Details		nting in final se grade (%)	Assessment Methods to CLO Mapping
	Assignm	ents			40	CLO 2,3,4
	Examina	ition			60	CLO 1,2,3
Required/recommended reading and contine materials		lei M., Kumar S.: Molecular Evolution and Phylogenetics (Oxford University Press, 2000) Hall B.G.: Phylogene rees Made Easy (Sinauer, 2004, 2nd ed.)				
Course Website		nttp://moodle.hku.hk/				
Additional Course			t to a minimum enrollment	number and availab	oility of teachers	S.
nformation		,			,	

BIOL4505	Oyster aquaculture (6 d	credits)	Academic Year	2020			
Offering Department	Biological Sciences		Quota	20			
Course Co-ordinator	Dr T Vengatesen, Biological	Sciences (rajan@hku.hk)					
Teachers Involved	(Dr T Vengatesen, School of	Biological Sciences)					
Course Objectives	-Introduce oyster biology and hatchery technology and aquaculture business; -Provide scientific basis for oyster aquaculture through field demonstrations and laboratory exercises; -Enable students to design, construct and maintain oyster hatchery for production of seeds for sustainable aquaculture and restoration of wild oysters; -Facilitate transfer of academic knowledge to oyster growers and aquaculture industry for sustainable, healthy and safe sea-food production:						
Course Contents & Topics	hatchery technology and comaintain coastal aquacultus shellfish production and reendeavor encompassing la aquaculture business. After marine larvae will be use Environmental issues, legisl covered using oyster aquacufacilities in Hong Kong, Zha	safe sea-food production; This experiential learning course is to enhance students' knowledge in one of the applied marine biology fields, i.e. hatchery technology and coastal aquaculture business that will enable them to design, construct, operate and maintain coastal aquaculture facilities and small-scale 'green and environmentally sustainable' business for shellfish production and restoration of wild benthic biodiversity in coastal habitats. This is an interdisciplinary endeavor encompassing larval hatchery technology, seafood quality, and economic dimensions of coastal aquaculture business. After reading about basic oyster biology and oyster aquaculture topics, we will focus on how marine larvae will be useful for human society through hatchery technology and aquaculture business. Environmental issues, legislation pertaining to coastal aquaculture business and community interaction will also be covered using oyster aquaculture in Hong Kong as an example. Students will be exposed to several aquaculture facilities in Hong Kong, Zhanjiang, and Qingdao to learn industrial and business skills of oyster aquaculture. This course is designed to meet the needs of an expanding sustainable aquaculture in Hong Kong and in mainland.					
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 gain scientific knowledge required for setting up oyster hatchery, farming and small-scale business, beside understanding biology and ecology of larvae and shellfishes and consider potential environmental effects on hatchery and farming						
	CLO 2 acquire skills and experiential learning opportunities (e.g. hands-on experiences at laboratories and farms) in oyster hatchery and aquaculture business, farming and industry						

	CLO 3 ex	plain the importance of	oyster farming in coastal habitat restora	tion			
	CLO 4 plan and execute a commercially important research project in marine science and coastal aquaculture						
	CLO 5 de	evelop novel ideas, and t	hink creatively, about hatchery product	on in relation to the aqu	aculture industry		
Pre-requisites	Pass in B	Pass in BIOL3109 or BIOL3203 or BIOL3301 or BIOL3303 or ENVS3004 or ENVS3313;					
and Co-requisites			advanced level disciplinary core/elective	e courses in the Ecolog	gy and Biodiversity		
and Impermissible			lajor or Biological Science Major.				
combinations)		udents who have passed					
Offer in 2020 - 2021		d sem Offer in 2021 - 2		Examination	No Exam		
Grade Descriptors (A+ to F)	В	multidimensional thinking ab outcomes. Demonstrate exc project data. Show highly eff	ght during the analysis of larval biology iss sout the study subject. Extensive knowledge and sellent ability to apply what you have learned in the fective organizational, presentational and field trip e and thought during the analysis of marine life	I skills required for attaining he class room to critically and skills.	all the course learning alyze the larval biology		
		analytical, critical and multid course learning outcomes. I real marine life science issue	limensional thinking about the study subject. Goo Demonstrate good ability to apply what you have es. Show effective organizational, presentational	od knowledge and skills requi e learned in the class room t and field trip skills.	red for attaining all the o critically analyze the		
	С	and skills required for attain	te knowledge and original thought during the an- ing all the course learning outcomes. Demonstra ze the real marine life science issues. Show con-	ite fair ability to apply what y	ou have learned in the		
	D	Evidence to show a minimus science issues. Show insuffi	um knowledge (i.e. knowledge is very incomple icient knowledge and skills required for attaining ve learned in the class room to critically analyze al and field trip skills.	all the course learning outcor	nes. Demonstrate poor		
	Fail Evidence of meager or inadequate knowledge and understanding of marine life science issues. Show no evidence of knowledge and skills required for attaining all the course learning outcomes. Demonstrate no ability to apply what you have learned in the class room to critically analyze the real marine life science issues. Show no evidence of familiarity with relevant reading material and field trip demonstrations, or any knowledge of organizational and presentational skills.						
Course Type	Field cam	ps					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures		including tutorial		40		
	Field work			50			
	Laboratory work		hands on training	30			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	Practical	25	CLO 3,4		
			Presentation: developing innovative				
	Report		ideas for sustainable and economically viable aquacultre in Hong Kong	50	CLO 4,5		
	Test		Written exam.	25	CLO 1,2		
Required/recommended reading and online materials	Molluscar	n Shellfish Farming (Brian	ironment (S.E. Shumway, John Wiley & n Spencer, John Wiley & Sons)	Sons)			
Course Website		odle.hku.hk					
Additional Course Information	Offer in alternate year from 20172018 - Tentative duration: May 24 to June, 2019 - Mainland field trips are compulsory - Taught and trained by several teachers, guest lecturers from government and aquaculture business sector						
	2nd week 3rd week	: Lectures and field trips	in Qingdao (China).This course will be	offered subject to a m	inimum enrollment		

BIOL4861	Ecology &	biodiversity	internsh	ip (6 credit	s)		Academic Year	2020
Offering Department	Biological Sc	ciences		• `	•		Quota	
Course Co-ordinator	Dr T Vengate	esen, Biological	Sciences (rajan @hku.h	k)			
Teachers Involved	(All academic	c staff in Ecolog	y & Biodive	ersity Major,E	iological Scien	ces)		
Course Objectives	knowledge a	To provide a stimulating experience for all Ecology & Biodiversity Major undergraduates to integrate and apply their knowledge and skills obtained from the Ecology & Biodiversity Major through gaining work experience in the field of Ecology & Biodiversity that are related to the major of study.						
Course Contents & Topics	University in obtained by	Students taking this course will work as an intern for at least 160 hours within the University or outside the University in a company, government department or NGO. The internship may be arranged by the School or obtained by students themselves. In the latter case, the internship must be in a relevant field to the Ecology & Biodiversity Major that the students are taking and prior approval by the course coordinator is required.						
Course Learning Outcomes	CLO 1 gain CLO 2 apply CLO 3 acqu	on successful completion of this course, students should be able to: CLO 1 gain first hand work experience in a job placement related to their Ecology & Biodiversity Major CLO 2 apply the knowledge in their Ecology & Biodiversity Major in solving practical problems in the work place CLO 3 acquire an understanding and appreciation of the real work environment CLO 4 extend their network in their field of study						
Pre-requisites (and Co-requisites and Impermissible combinations)	Major. This course i	Pass in at least 24 credits of advanced level disciplinary core / elective courses in the Ecology and Biodiversity						
Offer in 2020 - 2021	Y 1st se	m 2nd sem	Summer	Offer in 2021	- 2022 : Y		Examination	No Exam
Grade Descriptors (Pass /Pass with distinction /Fail)	Distincti on	performance in ha effective collabora	andling and o ation and con out in the Cou	carrying out the nmunication wit rse Description	work required in supervisor(s), co	the job or assignation	the workplace. Dem gned by supervisor(s) clients in the job. Suc llent performance in w	. Establishes highly coessfully fulfills the

	Pass Fail	or assigned by sup- clients in the job. Su- oral report, and eval Very limited or no a assigned by supervi- clients in the job. Fa	Able to apply knowledge to solve problems in the workplace. Successfully handles and carries out the work required or assigned by supervisor(s). Establishes effective collaboration and communication with supervisor(s), collections in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours oral report, and evaluation by supervisor(s), etc. Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other circlients in the job. Fails to satisfy the requirements set out in the Course Description regarding working hours, writeport, or evaluation by supervisor(s), etc.				
Course Type	Internship						
Course Teaching	Activities	8	Details		No. of Hours		
& Learning Activities	Internship work		at least 160 hours	at least 160 hours			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Written report		written report, supervisor's feedback and oral presentation	100	CLO 1,2,3,4		
Course Website	http://mod	dle.hku.hk					
Additional Course Information	about the institution Enrolmen relevant [nttp://moodle.hku.hk Students taking this course have to submit a written report of not less than 1,000 words and an oral presentation about their internships, which will be assessed by internal supervisors. Student's supervisor at work i.e. the nstitution offering the internship will also submit an assessment report to the University. Enrolment of this course is not conducted via the online course selection system and should be made through the relevant Department/School office after approval has been obtained from the course coordinator. BIOL4861 E&B internship is not a Capstone Course.					

BIOL4911	Conserv	vation science i	n practice (6 credits) Academic	Year 2020			
Offering Department	Biological	gical Sciences Quota 9					
Course Co-ordinator	TBC, Biol	TBC, Biological Sciences ()					
Teachers Involved							
Course Objectives	environme produce a science i economic scientific	ental science by us and successfully de n achieving meani c, and political conte	equired by students in the Biological Sciences in the fields of eing case studies that stimulate them to integrate the principles bate a topic in conservation science. Case studies will specific ngful conservation outcomes taking into account the need exts. Students will be expected to present their cases orally usuruse is a capstone course for Ecology & Biodiversity major /	and concepts learned to cally address the use of for considering social ing sound practical an			
Course Contents & Topics	specific p wider conducted address r wildlife trainstrumer will introd	scourse will use directed case studies to give students the opportunity to consider and synthesize solutions to cific problems in conservation and the application of conservation science in the modern world, and within the er context of economic development, political considerations and scientific uncertainty. Projects will be ducted through collaborations with local organizations, such as WWF-Hong Kong and Ocean Park, and ress real-life questions and issues. Possible case studies range from ecosystem services, biological footprints, life trade, to assessment of conservation risk, effectiveness of international conservation and biodiversity ruments, and the relationship between biodiversity and human livelihoods. Tutorials by the course coordinator introduce practical conservation concepts, develop critical thinking and address specific issues of relevance ass case studies.					
Course Learning	On succe	ssful completion of	this course, students should be able to:				
Outcomes	CLO 1 have an in-depth understanding of the topic studied, the major issues involved and the reprospects for further work in the area. CLO 2 have developed investigative skills associated with the case study selected which include organization and presentation of information and innovative and creative thinking around problem. CLO 3 understand the importance and complexities of conserving biodiversity. CLO 4 be able to identify practical and scientifically defensible initiatives and measures for sconservation intervention.						
	CLO 5 be able to competently present the case study and convincingly argue their case						
Pre-requisites (and Co-requisites and Impermissible combinations)	BIOL4XX This caps	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX of BIOL4XXX) in the Ecology & Biodiversity Major / Ecology & Biodiversity (Intensive) Major including BIOL3303. This capstone course is for Ecology & Biodiversity Major / Ecology & Biodiversity (Intensive) Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.					
Offer in 2020 - 2021	N Off	fer in 2021 - 2022 :	N Examinat	on			
Grade Descriptors (A+ to F)	В	outcomes. Show stro synthesize informatio range of complex, f addressing conservar reflective thinking and Demonstrate substar learning outcomes. S ability to apply knowl of clear attention to	In mastery at an advanced level of extensive knowledge and skills required for ong analytical and critical abilities and logical thinking, with strong evidence in across subject areas, including from practical work undertaken, and ability amiliar and unfamiliar situations and showing consideration of practical ation challenges. Apply highly effective presentational skills. Strong evidence I consideration of the wider issues of biodiversity conservation for Society. Itial command of a broad range of knowledge and skills required for attaining how evidence of analytical and critical abilities and logical thinking, with som adge to familiar and some unfamiliar situations. Demonstrate effective present thoughtful and reflective thinking and attention to detail. Consideration ment must be demonstrated including the importance of biodiversity conserval	e of ability to integrate and o apply knowledge to a widd and political dimensions for of attention to thoughtful and g at least most of the course e integration of materials and attional skills. Some evidency of practical components in			
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, ability to apply knowledge to most familiar situations and of relevance of biodiversity conservation for Society. Apply moderately effective presentational skills and understanding of the practical challenges of effective conservation initiatives. Little evidence of clear attention to thoughtful and reflective thinking.					
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities and little attempt at integration. Have basic understanding of importance of biodiversity for Society. Show limited ability to apply knowledge to solve problems or consider the practical challenges of biodiversity conservation. Apply limited effectiveness in presentational skills. Lack of attention to thoughtful and reflective thinking.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking or attention to detail. Show very little or no ability to apply knowledge or practical thinking to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Project-based course						
Course Teaching	Activitie	S	Details	No. of Hours			
& Learning Activities	Reading	/ Self study	supervised practical work of at least 80 hours followed written & oral reports. Tutorials provided by cours	120			

		coordinator	coordinator		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Oral presentation		40	CLO 1,2,4,5	
	Research report	project report	60	CLO 1,2,3,4,5	
Course Website	http://www.biosch.hku.hk/e	ecology/lsc/			
Additional Course Information		l in alternate year from 2017-2018 I subject to a minimum enrollment r	number and availability of teachers	S.	

BIOL4912	Sensory	evaluation of food	(6 credits)	Academic Ye	ar 2020		
Offering Department	_	ological Sciences Quota 15					
Course Co-ordinator	Dr J Č Y L	J C Y Lee, Biological Sciences (jettylee @hku.hk)					
Teachers Involved		•					
Course Objectives	perception	n of food. To develop ex		chological basis of human senso ication of sensory techniques, a ch.			
Course Contents & Topics	in mainlant lectures w perception descriptive food oral	s course will be offered in July in a 2-week intensive workshop format at a collaborating facility nainland China, to enable close study of food products in the Chinese marketplace. Preliminary tures will take place at the University of Hong Kong. Physiology and psychology of sensory ception. Objectives, planning and conduct of sensory testing. Discrimination testing, thresholds, scriptive analysis, affective testing. Instrument-sensory relationships, texture and aroma profiles, do oral processing, shelf-life studies, expert panels. Case studies of sensory applications in product					
Source Learning			nt, and consumer research.	lo to:			
Course Learning Outcomes			course, students should be ab				
Jutcomes			ysiological basis for human se nniques used in sensory testin				
	CLO 3 int	•	tion reports, and to design	and conduct sensory evaluat	ion projects using		
Pre-requisites	Pass in BI	OL3201; and					
and Co-requisites and Impermissible combinations)	BIOL4XXX	X) in the Food & Nutrion	. ,	elective biological sciences cou dents only.	ırses (BIOL3XXX d		
	The earlie	st that a student is allow	ved to take this capstone cour	se is their year 3 study.			
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : N		Examination			
Grade Descriptors (A+ to F)	A Demonstrate thorough grasp of the subject matter covered. Show strong analytical and critical abilities and logical thinking, with evidence of creative ability and competence in professional-level problem solving. Critically use lab skills and techniques and analysis of data and results to draw appropriate and insightful conclusions to real-world problems. Demonstrate highly effective team-based organizational and presentational skills.						
	B Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities and logical thinking with some evidence of competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results to draw generally appropriate conclusions to real-world problems. Demonstrate effective team-based organizational and presentational skills.						
	С						
	D						
	Fail Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Show lack of coherent and logical thinking, and minimal competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results ineffectively, leading generally to inappropriate and usually erroneous conclusions to real-world problems. Demonstrate ineffectiveness team-based organizational and presentational skills.						
Course Type		y and workshop course					
ourse Teaching	Activities		Details		No. of Hours		
Learning Activities	Laborator	•			48		
	Project w	ork			48		
	Tutorials		lectures/tutorials		24		
		Self study			30		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Laboratory reports			20	CLO 2,3		
	Project reports			60	CLO 2,3		
	Test			20	CLO 1,2,3		
Required/recommended reading and contine materials			ensory Evaluation Practices 3 Exercises for Sensory Evaluat				
Course Website	http://moo	dle.hku.hk/					
Additional Course			t to a minimum enrollment nur	mber and availability of teachers	i_		
Auditional Course							

BIOL4913	Advanced practicum on food and nutrient analysis (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	8
Course Co-ordinator	Dr J C Y Lee, Biological Sciences (jettylee@hku.hk)		
Teachers Involved	(Dr El-Nezami Hani, School of Biological Sciences) (Dr J C Y Lee, School of Biological Sciences)		
Course Objectives	Food products are analysed to follow the compliance with legal and labelling r quality, determination of nutritive value, research and development. The lecture the analytical procedures and techniques used to provide information about the	es and laboratory s	essions will cover

	analysis a	and toxicology experime	poratory classes is to give stuents, analysing data and rephere they will analytically as do products.	orting their findings. The st	udents are to work	
Course Contents & Topics	technique will have equivalen materials	s and contaminant assess hands-on experience in t methods. The student are assessed in food p	ues and cases studies demo sement for certain class of food analysing food products and is will learn how mycotoxins products. In-depth learning in and procedures for sample prep	s or food components will be will utilise analytical techniq assays, allergens and gene the use of different chroma	discussed. Students ues under AOAC or tically modified raw tography and mass	
Course Learning		· · · · · · · · · · · · · · · · · · ·	ourse, students should be able	to:		
Outcomes		e familiar with the food la	0 7			
			ropriate analytical techniques f	•		
			ety of analytical techniques for e		:!4 - 4 :	
			ge of the state of the art o		icai metnods, their	
	·		cation in complex food systems		tod lovola	
Pre-requisites			sment and compare the outcon anced level disciplinary core/el			
(and Co-requisites			anced level disciplinary core/ell and / or BIOL3209 in the Food &	0	uises (DIOLSAAA OI	
and Impermissible		,	Nutrional Science Major stude	,		
combinations)			ed to take this capstone course			
Offer in 2020 - 2021		er in 2021 - 2022 : N	·	Examination		
Grade Descriptors (A+ to F)	Α	Demonstrate a thorough grasp of the subject matter covered. Show strong analytical and critical abilities and logical thinking, with evidence of creative ability and competence in professional-level problem solving. Critically use lab skills and techniques and analysis of data and results to draw appropriate and insightful conclusions to real-world problems. Demonstrate highly				
	В	thinking with some evidence of competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results to draw generally appropriate conclusions to real-world problems. Demonstrate effective team-based				
	organizational and presentational skills. Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of analytical and critical abilities and logical thinking with limited competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results to draw moderately appropriate but sometimes erroneous conclusions to real-world problems. Demonstrate					
	moderately effective team-based organizational and presentational skills. Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Show some evidence of coherent and logical thinking, but lacking competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results to draw sometimes appropriate but often erroneous conclusions to real-world problems. Demonstrate team-based organizational and presentational skills of limited effectiveness.					
	Fail Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Show lack of coherent and logical thinking, and minimal competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results ineffectively, leading generally inappropriate and usually erroneous conclusions to real-world problems. Demonstrate ineffectiveness team-based organizational and presentational skills.					
Course Type		ith laboratory component	t course			
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures				24	
	Laborato	•			48	
		/ Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Project re	eport		50	CLO 1,2,3,4	
	Test 50 CL					
			dition (2010 Springer USA)			
reading and		Y. Pico, Chemical Analysis of Food Techniques and Applications (2012, Knovel, Science Direct on-line)				
online materials		•	AC International 19th Ed (2012	, AOAC International)		
Course Website		odle.hku.hk				
Additional Course Information	The cours	se will be offered subject	to a minimum enrollment numb	er and availability of teachers	3.	

Course Co-ordinator Teachers Involved Course Objectives Course Contents	, . , . ,	ehaviour and behav d research, with all experience in design behavioural ecology.	ioural ecology. It the excitement it ning, conducting,		
Teachers Involved Course Objectives	This course is offered as a capstone experience and unique experientia students to scientific reasoning and conceptual basis of studying animal be exposes students to 'research-in-making' and 'day-to-day logistics' of a field generates and all demanding challenges it brings along, with hands-on eanalysing, and successfully completing field studies of animal behaviour and behavi	ehaviour and behav d research, with all experience in design behavioural ecology.	ioural ecology. It the excitement it ning, conducting,		
Course Objectives	students to scientific reasoning and conceptual basis of studying animal be exposes students to 'research-in-making' and 'day-to-day logistics' of a field generates and all demanding challenges it brings along, with hands-on e analysing, and successfully completing field studies of animal behaviour and behaviour and behaviour.	ehaviour and behav d research, with all experience in design behavioural ecology.	ioural ecology. It the excitement it ning, conducting,		
Course Contents	students to scientific reasoning and conceptual basis of studying animal be exposes students to 'research-in-making' and 'day-to-day logistics' of a field generates and all demanding challenges it brings along, with hands-on e analysing, and successfully completing field studies of animal behaviour and behaviour and behaviour.	ehaviour and behav d research, with all experience in design behavioural ecology.	ioural ecology. It the excitement it ning, conducting,		
	Conducted in a field research site outside Hong Kong, this course teaches st	udents how to think	and a load and the calculation		
	analysing, and successfully completing field studies of animal behaviour and behavioural ecology. Conducted in a field research site outside Hong Kong, this course teaches students how to think analytically about animal behaviour, how to design a field research protocol, construct a conceptual framework of a research project and how to put this framework into a practice of collecting and analysing data. The course includes lectures informal discussions, review of research techniques, and extensive field component with daily research activities. It provides experiential learning through (i) direct participation in an ongoing field-based research, (ii) hands-on experience in application of diverse research techniques, (iii) hands-on involvement in collecting and analysing data, and (iv) engagement in scientific debates with researchers and research teams directly in their field study location. Students will be guided through the scientific reasoning and methodology, will learn a suite of research techniques and will exercise their skills in data gathering and interpretation, and will develop an understanding how individual research projects contribute to a greater understanding of behavioural and evolutionary processes and contribute to advancing science at large. The emphasis is placed on independent thinking and thoughtful application of the knowledge acquired previously during relevant classroom courses. Following the field-based component, students are required to give a seminar-type presentation on a selected topic and write a Course Report.				

Outcomes	CLO 1 understand of the biodiversity and primary habitats in the ecosystem studied						
	CLO 2 establish the basic skills needed to identify target species associated with the field course CLO 3 be knowledgeable about and able to implement sampling techniques for organisms in the particular						
	ecosystems studied CLO 4 understand the basic ecology of target species and how biotic and abiotic factors shape focal communities						
Pre-requisites	Pass in BIOL3101: and						
(and Co-requisites	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XX)						
and Impermissible	BIOL4XXX) in the Ecology & Biodiversity Major.						
combinations)			y & Biodiversity Major studer	ate only			
combinations)							
Offer in 2020 - 2021	The earliest that a student is allowed to take this capstone course is their year 3 study. N Offer in 2021 - 2022 : N Examination						
Grade Descriptors							
(A+ to F)	A Evidence of a thorough grasp of the subject and relevant research techniques. Eagerness and enthusiasm to learn and excellent familiarity with relevant background reading and case studies. Exemplary handling of field data collection and excellent analytical skills. Ample evidence of independent critical thought with excellent use of a broad range of fundamental concepts and broader comparative perspective to draw insightful and logical conclusions. Show outstanding abilities of independent work, effective presentation skills with excellent analytical argumentation. Excellent or outstanding work relative to what is required at degree level.						
	B Evidence of a good grasp of the subject and relevant research techniques. Interest in learning and good-to-moderate familiarity with relevant background reading and case studies. Good handling of field data collection and commendable analytical skills. Good evidence of critical thought (although not always independent), with an appreciable use of fundamental concepts and consideration of broader comparative perspective in drawing logical conclusions. Good abilities of independent work, effective presentation skills with logical and analytical argumentation. Work more than sufficient for what is required at degree level.						
	С	relevant background reading critical thinking (although no	and case studies, but no interest in t always independent), with mostly n mostly correct argumentation, bu	ct and relevant research techniques. learning beyond the adequate averag- good use of fundamental concepts to t limited (or no) abilities to integrate	e level. Evidence of logical draw logical conclusions.		
	D						
	Fail	background reading and no	familiarity with any relevant examp	the minimum relevant research tecloles and case studies. Inadequate evi and no abilities to draw meaningful	dence of coherent logical		
Course Type	Field cam	ps					
Course Teaching	Activities	5	Details		No. of Hours		
& Learning Activities	Lectures		lectures and tutorials	10			
_	Field work				72		
	Presentation		interactive debates		10		
	Reading / Self study		Interdedive debates	100			
			group project	15			
Assessment Methods	Assessment				-		
ssessment Methods d Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents		35	CLO 1,2,3,4		
	Report		project report (35%), g investigation & presenation	roup (30%) 65	CLO 1,2,3,4		
Required/recommended reading and		recommended reading a 00 characters)	nd online materials				
online materials	Lehner, P.N. 1996 (reprint 2002). Handbook of ethological methods. Cambridge University Press. Dugatkin, L.A. (ed.) 2001. Model systems in behavioral ecology. Integrating conceptual, theoretical, and empirical approaches. Princeton University Press.						
	Yamagiwa, J. & Karczmarski, L. (eds.) 2014. Primates and Cetaceans: Field research and conservation of complex mammalian societies. Springer Science.						
Course Website		v.biosch.hku.hk/ecology/					
Additional Course		nt Procedure:					
Information	The course is open to enrollment only during the add/drop period of the 2nd semester. Students are required to submit a brief (maximum 1-page) application letter (PDF file) via e-mail to the Course Coordinator (leszek@hku.hk) not later than 10th January. The application shall include the following: 1. Personal and academic details 2. ID photograph 3. Prief description of academic interests						
	 3. Brief description of academic interests 4. GPA 5. Pre-requisite courses taken and grades received (if pre-requisites are not met, a reasoned request for waiver). All applications will be reviewed prior to the commencement of the 2nd semester and results will be announced within the 1st week of the add/drop period of the 2nd semester. 						

BIOL4922	Food product development and evaluation (6 credits)	Academic Year	2020		
Offering Department	Biological Sciences	Quota	20		
Course Co-ordinator	Dr M F Wang, Biological Sciences (mfwang@hku.hk)				
Teachers Involved	(Dr M F Wang,Biological Sciences)				
Course Objectives	To introduce the key concepts and techniques used in food product development. To provide small group experience in the design, development and production of a new food product.				
Course Contents & Topics	History and future of the food industry; industrial product development process; idea generation and prototype development for new food products; quality management and legal protection; marketing strategies; food labeling; food package design; new product development for different food industries.				
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 understand the food product development cycle CLO 2 know the key steps in new product development CLO 3 demonstrate enhanced insight and understanding of current and future trends in the food industry CLO 4 have professional level practical experience in new product development CLO 5 know the main characteristics of different sectors of the food industry				
Pre-requisites	Pass in at least 24 credits of advanced level disciplinary core/elective biologic	cal sciences course	es (BIOL3XXX or		

(and Co-requisites and Impermissible	BIOL4XXX) included BIOL3203 and / or BIOL4205 in the Food & Nutritional Science Major. This capstone course is for Food & Nutritional Science Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study. Not for students who have passed in BIOL4210 Food product development.						
combinations)							
Offer in 2020 - 2021							
Grade Descriptors (A+ to F)	A Demonstrate thorough grasp of the subject matter covered. Show strong analytical and critical abilities and logical thinking, with evidence of creative ability and competence in professional-level problem solving. Critically use lab skills and techniques and analysis of data and results to draw appropriate and insightful conclusions to real-world problems. Demonstrate highly effective team-based organizational and presentational skills.						
	В	Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities and logical thinking with some evidence of competence in professional-level problem solving. Use lab skills and techniques and analysis of data and results to draw generally appropriate conclusions to real-world problems. Demonstrate effective team-based organizational and presentational skills.					
	С	· ·					
	D						
	Fail	Demonstrate little or no grand logical thinking, and material and results ineffective	rasp, with retention of little relevant information, o ininimal competence in professional-level problem s vely, leading generally to inappropriate and usu ss team-based organizational and presentational s	f the subject matter covered. Solving. Use lab skills and tech ally erroneous conclusions to	niques and analysis of		
Course Type	Laborator	aboratory and workshop course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Laboratory				48		
	Group wo	ork	80-100 hours group project work	100			
	Tutorials		6 lectures + 6 tutorials		12		
	Reading / Self study			100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	Assignments assessment of group product development project including food product presentation	100	CLO 1,2,3,4,5		
Required/recommended reading and online materials	E. Graf ar	A. L. Brody and J. B. Lord: Developing New Food Products for a Changing Marketplace (CRC Press, 2007) E. Graf and I. S. Saguy: Food Product Development (Avi Books, 1991) G. W. Fuller: New Food Product Development (CRC Press, 2005)					
Course Website	http://moodle.hku.hk/						
Additional Course	This course will be offered subject to a minimum enrollment number and availability of teachers.						

BIOL4962	Food & nu	tritional science i	nternship (6 credits)	Academic Year	2020		
Offering Department	Biological So	ciences	. ` `	Quota			
Course Co-ordinator	Dr J C Y Lee	Lee, Biological Sciences (jettylee@hku.hk)					
Teachers Involved	(All academi	academic staff in Food & Nutritional Science Major,Biological Sciences)					
Course Objectives	their knowled	a stimulating experience for all Food & Nutritional Science Major undergraduates to integrate and apply edge and skills obtained from the Food & Nutritional Science Major through gaining work experience in Food & Nutritional Science that are related to the major of study.					
Course Contents & Topics	University o arranged by						
Course Learning			ourse, students should be able to:				
Outcomes			ence in a job placement related to their Food &				
	CLO 2 apply the knowledge in their Food & Nutritional Science Major in solving practical problems in the work place						
	CLO 3 acquire an understanding and appreciation of the real work environment						
	CLO 4 extend their network in their field of study						
Pre-requisites	Pass in at le	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or					
(and Co-requisites	BIOL4XXX) in the Food & Nutritional Science Major.						
and Impermissible	This capstone course is for Food & Nutritional Science Major students only.						
combinations)	The earliest that a student is allowed to take this capstone course is their year 3 study.						
Offer in 2020 - 2021	Y 1st sem 2nd sem Summer Offer in 2021 - 2022 : Y Examination No Exam						
Grade Descriptors (Pass /Pass with distinction /Fail)	Distincti on	performance in handling and corrying out the work required in the job or assigned by supervisor(s). Establishes highly					
	Pass Able to apply knowledge to solve problems in the workplace. Successfully handles and carries out the work required in the job or assigned by supervisor(s), Establishes effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc. Students demonstrating excellent performance in the above would be awarded a grade of "Distinction".						
	Fail Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required in the job or assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other colleagues, or clients in the job. Fails to satisfy the requirements set out in the Course Description regarding working hours, written and oral report, or evaluation by supervisor(s), etc						
Course Type	Internship	•					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Internship work		at least160 hours (lunch hour excluded) in working days	at least 20	160		

Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Oral presentation		25	CLO 1,2,3,4
	Supervisor's feedback		50	CLO 1,2,3,4
	Written report		25	CLO 1,2,3,4
Course Website	http://moodle.hku.hk			
Additional Course Information	presentation about their internship supervisor at work i.e. the institution the University. Satisfactory completion of this co- be recorded on the student's tra- interested to enrol in this course se Enrolment of this course is not co	ps, which will be assessed ion offering the internship was can be counted towa anscript. This course will should contact the Departronducted via the online co	of not less than 1,000 words and an by internal supervisors. Student's will also submit an assessment reported the Capstone requirement. De be assessed on "Pass/Fail" basis nent to obtain the approval. surse selection system and should be obtained from the course coordinate.	ort to tails of internship will . Students who are be made through the

BIOL4963	Molecular	biology & biotech	nnology internship (6 credits)	Academic Yea	ar 2020		
Offering Department	Biological S			Quota			
Course Co-ordinator	Dr A Yan, B	Dr A Yan, Biological Sciences <i>(ayan8</i> @hku.hk)					
Teachers Involved			ology & Biotechnology Major,Biologi	,			
Course Objectives	To provide a stimulating experience for all Molecular Biology & Biotechnology Major undergraduates to integrate and apply their knowledge and skills obtained from the Molecular Biology & Biotechnology Major through gaining work experience in the field of Molecular Biology & Biotechnology that are related to the major of study.						
Course Contents & Topics	Students taking this course will work as an intern for at least 160 hours in at least 20 working days within the University or outside the University in a company, government department or NGO. The internship may be arranged by the School or obtained by students themselves. In the latter case, the internship must be in a relevant field to the Molecular Biology & Biotechnology Major that the students are taking and prior approval by the course coordinator is required.						
Course Learning		On successful completion of this course, students should be able to:					
Outcomes	CLO 2 appl work	y the knowledge in th cplace	ience in a job placement related to the important of the real works and appropriate and approp	gy Major in solving practi			
		nd their network in the	and appreciation of the real work en eir field of study	vironment			
Pre-requisites (and Co-requisites and Impermissible combinations)	Biotechnolog This capstor	gy Major. ne course is for Molec	dvanced level disciplinary core / e ular Biology & Biotechnology Major s red to take this capstone course is the	students only.	lolecular Biology &		
Offer in 2020 - 2021	Y 1st se	em 2nd sem Sumn	ner Offer in 2021 - 2022 : Y	Examination	No Exam		
Grade Descriptors (Pass /Pass with distinction /Fail)	Distincti on Demonstrates excellent ability in applying knowledge to solve problems in the workplace. Demonstrates excellent performance in handling and carrying out the work required in the job or assigned by supervisor(s). Establishes highly effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours, with excellent performance in written and oral report, and excellent evaluation by supervisor(s), etc.						
	Able to apply knowledge to solve problems in the workplace. Successfully handles and carries out the work required in the job or assigned by supervisor(s). Establishes effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc. Students demonstrating excellent performance in the above would be awarded a grade of "Distinction".						
	Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required in the job or assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other colleagues, or clients in the job. Fails to satisfy the requirements set out in the Course Description regarding working hours, written and oral report, or evaluation by supervisor(s), etc						
Course Type	Internship						
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Internship w	vork	at least 160 hours (lunch hour excluded) in at least 20 working days		160		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Written repo	ort	written report, supervisor's feedback and oral presentation	100	CLO 1,2,3,4		
Course Website	http://moodle	e.hku.hk	·				
Additional Course Information	Students taking this course have to submit a written report of not less than 1,000 words and an oral presentation about their internships, which will be assessed by internal supervisors. Student's supervisor at work i.e. the institution offering the internship will also submit an assessment report to the University. Satisfactory completion of this course can be counted towards the Capstone requirement. Details of internship will be recorded on the student's transcript. This course will be assessed on "Pass/Fail" basis. Students who are						
	interested to enrol in this course should contact the Department to obtain the approval. Enrolment of this course is not conducted via the online course selection system and should be made through the relevant Department/School office after approval has been obtained from the course coordinator.						

BIOL4964	Biological sciences internship (6 credits) Academic Year 2020				
Offering Department	Biological Sciences	Quota			
Course Co-ordinator	Dr S Cannicci (Sem 1 & 2); Dr Y W Chan (Summer), Biological Sciences (cannic	cci@hku.hk; gywc	han @hku.hk)		
Teachers Involved	(All academic staff in Biological Sciences Major, Biological Sciences)				
Course Objectives	To provide a stimulating experience for all Biological Sciences major undergraduates to integrate and apply their knowledge and skills obtained from the Biological Sciences Major through gaining work experience in the field of Biological Sciences that are related to the major of study.				

Course Contents & Topics	Students taking this course will work as an intern for at least 160 hours in at least 20 working days within the University or outside the University in a company, government department or NGO. The internship may be arranged by the School or obtained by students themselves. In the latter case, the internship must be in a relevant field to the Biological Sciences major that the students are taking and prior approval by the course coordinator is required					
Course Learning	On successf	ul completion of this c	ourse, students should be able to:			
Outcomes	CLO 1 gain	first hand work exper	ience in a job placement related to t	neir Biological Sciences I	Major	
			eir Biological Sciences Major in solvi	0	the work place	
			and appreciation of the real work en	vironment		
		nd their network in the	•			
Pre-requisites			anced level disciplinary core/elective	e biological sciences coι	irses (BIOL3XXX or	
(and Co-requisites		in the Biological Scien				
and Impermissible			ical Sciences Major students only.			
combinations)			ed to take this capstone course is th			
Offer in 2020 - 2021			ner Offer in 2021 - 2022 : Y	Examination	No Exam	
Grade Descriptors (Pass /Pass with distinction /Fail)	Distincti on	Distincti on Demonstrates excellent ability in applying knowledge to solve problems in the workplace. Demonstrates excellent performance in handling and carrying out the work required in the job or assigned by supervisor(s). Establishes highly effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours, with excellent performance in written and oral report, and excellent evaluation by supervisor(s), etc.				
	Pass	Able to apply knowledge to solve problems in the workplace. Successfully handles and carries out the work required in the job or assigned by supervisor(s). Establishes effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc. Students demonstrating excellent performance in the above would be awarded a grade of "Distinction".				
	Fail Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required in the job or assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other colleagues, or clients in the job. Fails to satisfy the requirements set out in the Course Description regarding working hours, written and oral report, or evaluation by supervisor(s), etc					
Course Type	Internship					
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Internship w	ork	at least160 hours (lunch hour ex working days	cluded) in at least 20	160	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Written repo	ort	written report, employer's feeback and oral presentation	100	CLO 1,2,3,4	
Course Website	http://moodle	e.hku.hk				
Additional Course Information	Students taking this course have to submit a written report of not less than 1,000 words and an oral presentation about their internships, which will be assessed by internal supervisors. Student's supervisor at work i.e. the institution offering the internship will also submit an assessment report to the University. Satisfactory completion of this course can be counted towards the Capstone requirement. Details of internship we be recorded on the student's transcript. This course will be assessed on "Pass/Fail" basis. Students who are interested to enrol in this course should contact the Department to obtain the approval. Enrolment of this course is not conducted via the online course selection system and should be made through the relevant Department/School office after approval has been obtained from the course coordinator.				ort to ails of internship will . Students who are the made through the	

BIOL4991	Ecology	& biodiversity project (12 credits)	Academic Year	2020		
Offering Department	Biological	Sciences	Quota			
Course Co-ordinator	Dr S W Y S	Sin, Biological Sciences (sinyw@hku.hk)				
Teachers Involved	(All acader	mic staff in E&B Major / E&B Intensive Major, Biological Scie	nces)			
Course Objectives	(Intensive) Biodiversity	To provide a stimulating capstone experience for Ecology & Biodiversity Major / Ecology & Biodiversity Major (Intensive) undergraduates to integrate and apply their knowledge and skills obtained from the Ecology & Biodiversity Major / Ecology & Biodiversity (Intensive) through planning and carrying out a research project under the supervision of a member of staff.				
Course Contents & Topics	admission	Students should seek approval from a prospective supervisor prior to selecting this course. After admission to the course is approved by the course coordinator, students will complete their project work under the guidance of their supervisor.				
Course Learning		sful completion of this course, students should be able to:				
Outcomes		tique and review appropriate scientific literature				
	CLO 2 use this information to generate a scientifically relevant research question					
	CLO 3 develop and formulate innovative scientific hypotheses to test this question					
	CLO 4 design and undertake practical research work to formally test the hypotheses proposed					
	CLO 5 analyse and evaluate the data collected to test the hypotheses, present data in a professional manner to illustrate the outcomes					
	CLO 6 draw an objective series of conclusions based on the experimental work					
	CLO 7 highlight and critically discuss their research findings and place them into a holistic scientific context					
	CLO 8 submit their work following a specified journal format, present their work as a scientific conference talk					
Pre-requisites (and Co-requisites and Impermissible combinations)	Major / Eco This capsto	Pass in at least 24 credits of advanced level disciplinary core / elective courses in the Ecology & Biodiversity Major / Ecology & Biodiversity Major (Intensive); and This capstone course is for Ecology & Biodiversity Major / Ecology & Biodiversity Major (Intensive) students only. The earliest that a student is allowed to take this capstone course is their year 3 study.				
Offer in 2020 - 2021		r long Offer in 2021 - 2022 : Y	Examination	No Exam		
Grade Descriptors (A+ to F)	Α	Evidence of complete or near-complete understanding and a thoroug attainment of all learning outcomes. Excellent critique and knowledge hypothesis. Well designed experimental approach to test research hyposkills and laboratory/fieldwork techniques. Demonstrate comprehensive presentation of research work.	e of relevant literature and ident othesis. Show excellent organization	fication of research onal and/or analytical		
	B Evidence of near-complete understanding and a good grasp of the subject matter as demonstrated by attainment of the majority of learning outcomes. Good critique and knowledge of relevant literature and identification of research hypothesis. Appropriately designed experimental approach to test research hypothesis. Show good organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate effective, critical, assessment of results and good presentation of research work.					

	С	most of the learning outor Adequately designed explaboratory/fieldwork technicsearch work.	derstanding and grasp of the subject matter omes. Acceptable critique and knowledge of r oerimental approach to test research hypothe niques. Demonstrate adequate but not neces	elevant literature and identifications sis. Show fair organizational are sarily critical, assessment of re	on of research hypothesis. Ind/or analytical skills and sults and presentation of
	D	learning outcomes. Limi designed experimental	rstanding and grasp of the subject matter as ted critique and knowledge of relevant liter approach to test research hypothesis. S niques. Demonstrate confused and poorly org	ature and identification of rese	earch hypothesis. Poorly or analytical skills and
	Fail	attained. Poor critique experimental approach to	equate understanding and grasp of the subjet and knowledge of relevant literature and b test research hypothesis. Show little evidenc niques. Demonstrate incorrect interpretation	identification of research hypore of appropriate organizational a	othesis. Badly designed and/or analytical skills and
Course Type	Project-ba	sed course			
Course Teaching	Activities		Details	No. of Hours	
& Learning Activities	Reading /	Self study	formal lectures, seminars & practical work		144
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Dissertation		Written report (<12000 words)	70	CLO 1,2,3,4,5,6,7,8
	Oral pres	entation		30	CLO 1,2,3,4,5,6,7
Course Website	http://moo	dle.hku.hk			

BIOL4992	Food & nutritional science project (12 credits) Academic Year 2020					
Offering Department		l Sciences	project (12 cround)	Quota		
Course Co-ordinator		ko, Biological Science	es (tsobko@hku.hk)	4.00		
Teachers Involved		(All academic staff in Food & Nutritional Science Major Biological Sciences)				
Course Objectives	and apply	y their knowledge ar	stone experience for Food & Nutrind skills obtained from the Food & tunder the supervision of a member	& Nutritional Science Major th		
Course Contents & Topics	admissio	Students should seek approval from a prospective supervisor prior to selecting this course. After admission to the course is approved by the course coordinator, students will complete their project work under the guidance of their supervisor.				
Course Learning			nis course, students should be able	e to:		
Outcomes			propriate scientific literature			
			generate a scientifically relevant re			
			scientific hypotheses to test this q			
			practical research work to formally	* * * * * * * * * * * * * * * * * * * *		
	ill	ustrate the outcomes	the data collected to test the hyposesses of conclusions based on the exp		ressional manner to	
		•	heir research findings and place th		ntext	
			wing a specified journal format, pre			
Pre-requisites (and Co-requisites and Impermissible combinations)	BIOL4XX Cumulati This caps	(X) in the Food & Nut we GPA of 3.0 or abo stone course is for Fo	od & Nutritional Science Major stu	dents only.	urses (BIOL3XXX o	
011 1 0000 0001			Illowed to take this capstone cours		N E	
Offer in 2020 - 2021 Grade Descriptors	Y Ye	ar long Offer in 202	or near-complete understanding and a	Examination	No Exam	
(A+ to F)		attainment of all learning outcomes. Excellent critique and knowledge of relevant literature and identification of research hypothesis. Well designed experimental approach to test research hypothesis. Show excellent organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate comprehensive, critical, assessment of results and professional presentation of research work.				
	В	of learning outcomes. Good critique and knowledge of relevant literature and identification of research hypothesis. Appropriately designed experimental approach to test research hypothesis. Show good organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate effective, critical, assessment of results and good presentation of research work.				
	C Evidence of adequate understanding and grasp of the subject matter as demonstrated by general but incomplete attainment of most of the learning outcomes. Acceptable critique and knowledge of relevant literature and identification of research hypothesis. Adequately designed experimental approach to test research hypothesis. Show fair organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate adequate but not necessarily critical, assessment of results and presentation of research work.					
	D Evidence of limited understanding and grasp of the subject matter as demonstrated by incomplete attainment of many of the learning outcomes. Limited critique and knowledge of relevant literature and identification of research hypothesis. Poorly designed experimental approach to test research hypothesis. Show fair organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate confused and poorly organized assessment of results and limited presentation of research work.					
	Fail Evidence of poor or inadequate understanding and grasp of the subject matter such that most of the learning outcomes are not attained. Poor critique and knowledge of relevant literature and identification of research hypothesis. Badly designed experimental approach to test research hypothesis. Show little evidence of appropriate organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate incorrect interpretation and assessment of results and poor presentation of research work.					
Course Type	Project-b	ased course				
Course Teaching	Activitie	-	Details		No. of Hours	
& Learning Activities		/ Self study	formal lectures, seminars & p		144	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Dissertat			80	CLO 1,2,3,4,5,6,7,8	
		sentation	research seminar	20	CLO 5,7	
Course Website	latter //wa a	odle.hku.hk/				

As BIOL4992 "FNS project"is a whole year course, students should enrol this course during the course selection period or the add/drop period in the 1st Semester only.

BIOL4993	Molecul	ar biology & biote	echnology project (12 credits)	Academic Ye	ar 2020		
Offering Department	Biological			Quota			
Course Co-ordinator		Biological Sciences					
Teachers Involved			jor / MBB Intensive Major,Biological Sc	,			
Course Objectives	& Biotech the Molec	To provide a stimulating capstone experience for all Molecular Biology & Biotechnology Major / Molecular Biology & Biotechnology Major (Intensive) undergraduates to integrate and apply their knowledge and skills obtained from the Molecular Biology & Biotechnology Major / Molecular Biology & Biotechnology Major (Intensive) through planning and carrying out a research project under the supervision of a member of staff.					
Course Contents & Topics	course is	Students should seek approval from a prospective supervisor prior to selecting this course. After admission to the course is approved by the course coordinator, students will complete their project work under the guidance of their supervisor.					
Course Learning			nis course, students should be able to:				
Outcomes			propriate scientific literature				
		·	generate a scientifically relevant rese	arch guestion			
			e scientific hypotheses to test this ques	•			
		•	e practical research work to formally tes		d		
			the data collected to test the hypothes		-		
		•	essional manner to illustrate the outco				
			ies of conclusions based on the experi				
		•	their research findings and place them		ntext		
Pre-requisites			of advanced level disciplinary core /				
and Co-requisites and Impermissible combinations)	Biotechno Cumulativ This caps	ology Major / Molecula ve GPA of 3.0 or abov	ar Biology & Biotechnology Major (Inte	nsive); and	37		
	The earlie	st that a student is al	llowed to take this capstone course is t	heir year 3 study.			
Offer in 2020 - 2021	Y Yea	ar long Offer in 202	1 - 2022 : Y	Examination	No Exam		
Grade Descriptors (A+ to F)	A Evidence of complete or near-complete understanding and a thorough grasp of the subject matter as demonstrated by attainment of all learning outcomes. Excellent critique and knowledge of relevant literature and identification of research hypothesis. Well designed experimental approach to test research hypothesis. Show excellent organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate comprehensive, critical, assessment of results and professional presentation of research work.						
	B Evidence of near-complete understanding and a good grasp of the subject matter as demonstrated by attainment of the majority of learning outcomes. Good critique and knowledge of relevant literature and identification of research hypothesis. Appropriately designed experimental approach to test research hypothesis. Show good organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate effective, critical, assessment of results and good presentation of research work.						
	C Evidence of adequate understanding and grasp of the subject matter as demonstrated by general but incomplete attainment of most of the learning outcomes. Acceptable critique and knowledge of relevant literature and identification of research hypothesis. Adequately designed experimental approach to test research hypothesis. Show fair organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate adequate but not necessarily critical, assessment of results and presentation of research work.						
	D	D Evidence of limited understanding and grasp of the subject matter as demonstrated by incomplete attainment of many of the learning outcomes. Limited critique and knowledge of relevant literature and identification of research hypothesis. Poorly designed experimental approach to test research hypothesis. Show fair organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate confused and poorly organized assessment of results and limited presentation of research work.					
	Fail Evidence of poor or inadequate understanding and grasp of the subject matter such that most of the learning outcomes are not attained. Poor critique and knowledge of relevant literature and identification of research hypothesis. Badly designed experimental approach to test research hypothesis. Show little evidence of appropriate organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate incorrect interpretation and assessment of results and poor presentation of research work.						
Course Type	Project-ba	ased course					
Course Teaching	Activities		Details		No. of Hours		
Learning Activities		/ Self study	formal lectures, seminars & practi	cal work	144		
assessment Methods nd Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Dissertati	ion		80	CLO 1,2,3,4,5,6,7,8		
	Oral pres	entation	research seminar	20	CLO 1,6,7,8		
ourse Website	http://moo	dle.hku.hk/	http://moodle.hku.hk/				
Journey Homorica		A dissertation of about 9,000 - 12,000 words (80% weighting) and a research seminar (20% weighting).					

BIOL4994	Biologi	cal sciences project (12 credits)	Academic Year	2020	
Offering Department	Biologica	al Sciences	Quota		
Course Co-ordinator	Dr S Cai	nnicci, Biological Sciences <i>(cannicci</i> @hku.hk)			
Teachers Involved	(All acad	lemic staff in Biological Sciences Major,Biological Sciences)			
Course Objectives	apply the	To provide a stimulating capstone experience for all Biological Sciences Major undergraduates to integrate and apply their knowledge and skills obtained from the Biological Science Major through planning and carrying out a research project under the supervision of a member of staff.			
Course Contents & Topics		s should seek approval from a prospective supervisor prior to selecting s approved by the course coordinator, students will complete their proje or.			
Course Learning	On succ	essful completion of this course, students should be able to:			
Outcomes	CLO 1	critique and review appropriate scientific literature			
	CLO 2	use this information to generate a scientifically relevant research quest	ion		
	CLO 3	develop and formulate scientific hypotheses to test this question			
	CLO 4 design and undertake practical research work to formally test the hypotheses proposed				
	CLO 5	analyse and evaluate the data collected to test the hypotheses			

	CLO 6	present data in a profess	sional manner to illustrate the	outcomes		
	CLO 7 draw an objective series of conclusions based on the experimental work					
	CLO 8	highlight and discuss the	ir research findings and place	them into a holistic scientific co	ontext	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Biological Sciences Major; and Cumulative GPA of 3.0 or above. This capstone course is for Biological Sciences Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.					
Offer in 2020 - 2021		ear long Offer in 2021 -	•	Examination	No Exam	
Grade Descriptors (A+ to F)	Α	attainment of all learning of hypothesis. Well designed of	outcomes. Excellent critique and k experimental approach to test resea ork techniques. Demonstrate com	a thorough grasp of the subject mat nowledge of relevant literature and io rich hypothesis. Show excellent organi, prehensive, critical, assessment of re	dentification of research zational and/or analytical	
	В	of learning outcomes. Good designed experimental ap	critique and knowledge of relevant proach to test research hypothes	the subject matter as demonstrated by a literature and identification of research sis. Show good organizational and/o assessment of results and good present	hypothesis. Appropriately or analytical skills and	
	Evidence of adequate understanding and grasp of the subject matter as demonstrated by general but incomplete attainment of most of the learning outcomes. Acceptable critique and knowledge of relevant literature and identification of research hypothesis. Adequately designed experimental approach to test research hypothesis. Show fair organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate adequate but not necessarily critical, assessment of results and presentation of research work.					
	D	D Evidence of limited understanding and grasp of the subject matter as demonstrated by incomplete attainment of many of the learning outcomes. Limited critique and knowledge of relevant literature and identification of research hypothesis. Poorly designed experimental approach to test research hypothesis. Show fair organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate confused and poorly organized assessment of results and limited presentation of research work.				
	Fail Evidence of poor or inadequate understanding and grasp of the subject matter such that most of the learning outcomes are not attained. Poor critique and knowledge of relevant literature and identification of research hypothesis. Badly designed experimental approach to test research hypothesis. Show little evidence of appropriate organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate incorrect interpretation and assessment of results and poor presentation of research work					
Course Type	Project-l	based course				
Course Teaching	Activiti	es	Details		No. of Hours	
& Learning Activities	Reading	g / Self study	formal lectures, seminars &	practical work	144	
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Disserta	ation		80	CLO 1,2,3,4,5,6,7,8	
	Oral pre	esentation	research seminar	20	CLO 1,2,3,4,5,6,7,8	
Course Website		oodle.hku.hk/				
Additional Course Information	A disser	tation of about 9,000 - 12,	000 words (80% weighting) a	nd a research seminar (20% we	eighting).	

ENVS1301	Environmental life science (6 credits)	Academic Year	2020			
Offering Department	Biological Sciences	Quota	60			
Course Co-ordinator	Dr T Vengatesen, Biological Sciences (rajan@hku.hk)					
Teachers Involved	(Dr T Vengatesen, Biological Sciences)					
Course Objectives	This course intended for students who wish to understand the fundamental and importantly the relationship (connection) between environment and life biological/ecological principles and concepts of environmental science which evaluation of current global environmental issues including human ecolog and climate change.	. Here you will learn and are needed for critic	about the various al discussion and			
Course Contents & Topics	This course is a combination of lectures, group discussion/debate and field fundamental interactions between organisms and their environment. We the life at various ecosystems (like marine, freshwater, and terrestrial). Studer urbanization, climate change, and anthropogenic impacts affect life at popul students will be exposed to the incredible interrelationships that are basic that human development has upon these interrelationships. After learning students will be stimulated to think about current life science issues such as to climate change, tragedy of commons (human ecology) and applied lif science.	n explore environments will also learn how ation and ecosystem to ecological principle basics of environme biodiversity loss, orga	tal constraints on y factors such as levels. Similarly, as and the impact ental life science, anisms adaptation			
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 understand life, environment and their interactions					
	CLO 2 appreciate species and ecosystem responses to human-induced environmental change					
	CLO 3 attain ability to critically think and discuss about current environ-life science issues					
	CLO 4 be motivated and equipped: to tackle biological environmental science questions and to choose advanced environmental science courses					
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL					
Offer in 2020 - 2021	Y 2nd sem Offer in 2021 - 2022 : Y	Examination	May			
Grade Descriptors (A+ to F)	A Evidence of original thought during the analysis of environmental life science is multidimensional thinking about the study subject. Extensive knowledge and sk outcomes. Demonstrate excellent ability to apply what you have learned in environmental life science issues. Show highly effective organizational, presental	ills required for attaining al the class room to critica	I the course learning			
	B Show substantial knowledge and thought during the analysis of environmental life science issues. Show some evidence of some analytical, critical and multidimensional thinking about the study subject. Good knowledge and skills required for attaining all the course learning outcomes. Demonstrate good ability to apply what you have learned in the class room to critically analyze the real environmental life science issues. Show effective organizational, presentational and field trip skills.					
	Show general but incomplete knowledge and original thought during the anal knowledge and skills required for attaining all the course learning outcomes.	lysis of environmental life				

		learned in the class room to critically analyze the real environmental life science issues. Show considerable organizational, presentational and field trip skills.				
	D	life science issues. Show in poor ability to apply what yo	sufficient knowledge and skills rec	very incomplete) and thought during the a quired for attaining all the course learning o critically analyze the real environmental	outcomes. Demonstrate	
	Fail	knowledge and skills requir learned in the class room to	red for attaining all the course lead o critically analyze the real enviro	nding of environmental life science issue arning outcomes. Demonstrate no ability onmental life science issues. Show no ev knowledge of organizational and presenta	to apply what you have idence of familiarity with	
Course Type	Lecture w	rith laboratory componen	t course			
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures				24	
	Field work		3-12 hours field work	12		
	Tutorials			12		
	Reading / Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignments			10	CLO 2,3	
	Examina	tion		70	CLO 1,3	
	Presenta	tion	group presentation	10	CLO 3,4	
	Test			10	CLO 1	
Required/recommended reading and online materials	Appropria	Appropriate reading materials/handouts will be provided during the course.				
Course Website	http://mod	odle.hku.hk				
Additional Course Information	This cour	This course will be offered subject to a minimum enrollment number and availability of teachers.				

ENVS2001	Method	s in environmental	science (6 credits)	Academic Yea	ar 2020		
Offering Department	Biologica	l Sciences	•	Quota	42		
Course Co-ordinator	Dr D M B	Dr D M Baker, Biological Sciences (dmbaker@hku.hk)					
Teachers Involved	(Dr D M Baker,Biological Sciences)						
Course Objectives	To introduce students to a broad spectrum of field and laboratory methods for data collection in environmental science. Through exposure to environmental data collection, experimental design, data analysis, interpretation and reporting, students will gain a deeper appreciation of the process that underlies environmental science research and it's relevancy to critical thinking and future careers in the sciences.						
Course Contents & Topics	cover ba based ex the bios experience	This course will involve environmental data collection in both field and laboratory settings. In-class lectures will cover basic principles of specific methodologies and relevant applications in preparation for laboratory and field based experiential learning. Having an interdisciplinary focus, the course will cover topics relevant to the study of the biosphere, encompassing terrestrial, aquatic, and atmospheric systems. Students will gain hands-on experience with the operation of standard and advanced sampling and analytical equipment, quality control, basic data analysis and reporting.					
Course Learning			course, students should be able	e to:			
Outcomes		•	data is used to address enviro				
	d	ata	,	nodologies necessary for collection, and how this impacts data			
				e used to critically evaluate idea			
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in BIOL1309 or EASC1401 or ENVS1301 or ENVS1401					
Offer in 2020 - 2021	Y 1s	t sem Offer in 2021 - 2	*	Examination	No Exam		
Grade Descriptors (A+ to F)	В	Demonstrate thorough grasp of the subject. Show strong analytical and critical abilities and logical thinking, with evidence original thought. Apply highly effective lab / fieldwork skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills. Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Apply effective lab fieldwork skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and					
	С	Apply moderately effective lab / fieldwork skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	D	,, ,					
	Fail	analytical and critical abilit	ies, logical and coherent thinking. Ap and results and/or unable to draw app	nd understanding of the subject. Evid ply minimally effective or ineffective la ropriate conclusions. Organization and	ıb / fieldwork skills an		
Course Type	Laborato	ry and workshop course					
Course Teaching	Activitie	S	Details		No. of Hours		
Learning Activities	Laborato	ory			30		
	Field wo	rk			10		
	Project v	vork			20		
	Tutorials				12		
	Reading	/ Self study			60		
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods		
and troigning					to CLO Mappin		
and moighting	Assignm	ents		10	to CLO Mappin CLO 1,2,3		

	Presentation	20	CLO 2,3
	Project reports	50	CLO 1,2,3,4
Course Website	http://moodle.hku.hk		

ENVS2002	Environ	mental data analy	sis (6 credits)	Academic Yea	r 2020		
Offering Department	Biological	65					
Course Co-ordinator	Dr T C Bo	T C Bonebrake, Biological Sciences (tbone @hku.hk)					
Teachers Involved	,	Or M Yasuhara,School of Biological Sciences) Or T C Bonebrake,School of Biological Sciences)					
		,					
Course Objectives	To provide students with the ability to analyze data; especially data which are relevant to issues and convironmental science. This course will enable students to accurately interpret, organize, display, test a environmental data. The course will also introduce students to principles of a variety of important						
			onmental data including spatial ar	nalysis, geographic informatio	n systems, remot		
Sauraa Camtanta		sing, risk assessment, and time series analysis. e course will feature lectures on aspects of sampling, distributions, uncertainty, probability, and hypothes					
Course Contents & Topics	testing in a most environ in environ in a comp	The course will reature lectures on aspects of sampling, distributions, uncertainty, probability, and hypothesis esting in addition to lectures on advanced analysis topics. Special emphasis will be placed on qualities inherent to most environmental datasets such as large size, multivariate, and spatial. All material will be applied and practiced n environmental science contexts (e.g. chemistry, ecology, geology and oceanography) using a variety of datasets n a computer laboratory setting using the 'R Project for Statistical Computing' software (a graphical user interface will be implemented such that prior knowledge of coding or computer science is not required).					
Course Learning			is course, students should be able				
Outcomes		•	nethods and approaches in the scie				
	CLO 2	evaluate critically dat	a analyses in the environmental sc	iences			
	CLO 3	perform standard and	d appropriate statistical analyses or	n a variety of data sources			
	CLO 4	work comfortably witl	n large datasets using applied softv	vare (e.g. R)			
	CLO 5	present results of dat	a analyses in a clear and transpare	ent manner			
Pre-requisites and Co-requisites and Impermissible	Pass in BI	OL1309 or EASC140	01 or ENVS1301 or ENVS1401				
combinations) Offer in 2020 - 2021	Y 2nd	Offer in 2021	2022 · V	Evemination	Mov		
Grade Descriptors	Y ∠110	sem Offer in 2021		Examination	May		
(A+ to F)	analytical and critical abilities and logical thinking, with evidence of original thought. Apply a highly effective computational skills and techniques for basic statistical analyses. Be able to critically use data and statistical results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.						
	В	B Demonstrate substantial grasp of the subject and skills required for attaining at least most of the course learning outcomes. Present evidence of analytical and critical abilities and logical thinking. Apply effective computational skills and techniques for basic statistical analyses. Be able to correctly use data and statistical results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete grasp of the subject and skills required for attaining some of the course learning outcomes. Present evidence of some analytical and critical abilities and logical thinking. Apply moderately effective computational skills and techniques for basic statistical analyses. Demonstrate mostly correct but some erroneous use of data and statistical results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	D	ulaw appropriate conclusions. Apply intoderately enecutive origanizational and presentational smile. Demonstrate partial and limited grasp of the subject and skills required for attaining some of the course learning outcomes. Present evidence of some analytical and critical abilities and logical thinking, but with limited analytical and critical abilities. Apply limited or barely effective computational skills and techniques for basic statistical analyses. Demonstrate limited ability to use data and statistical results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate limited or no grasp of the subject and skills required for attaining any of the course learning outcomes. Present evidence of little or lack of analytical and critical abilities, logical or coherent thinking. Apply minimally effective or ineffective computational skills and techniques for basic statistical analyses. Demonstrate misuse of data and statistical results and/or unable to draw appropriate conclusions. Apply minimally effective or ineffective organizational and presentational skills.						
Course Type	Lecture wi	th laboratory compor		· ·			
Course Teaching	Activities	· · ·	Details		No. of Hours		
Learning Activities	Lectures				24		
	Laborator	у	problem-based learning/computer laboratory		24		
	Tutorials	•			6		
		Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examinat	ion		25	CLO 1,2,3		
	Project re			25	CLO 1,2,3,4,5		
	Test		problem-based exercises	50	CLO 1,2,3,4,5		
Required/recommended eading and online materials		ics through Biological Data. Sp ied Environmental Statistics w					
	Reference Zhang C.		of Environmental Sampling and An	alysis. John Wiley & Sons, Ne	w Jersey.		
Course Website							

ENVS3004	Environment, society and economics (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	
Course Co-ordinator	Dr C Dingle, Biological Sciences (cdingle@hku.hk)		
Teachers Involved	(Dr C Dingle, School of Biological Sciences)		
Course Objectives	This course follows up issues highlighted in the introductory course and providurban environments for students to examine the problems of resource scarcity natural environment, which are the problems human society is currently confront environmental problems and explore how Environmental Economics can be apprenvironmental restoration/protection. Students will analyze the nature of key n	r and pollutant acouted. The course wolled for resource ι	cumulation in the rill focus on major management and

		d biomass, and explore le economies.	ways to improve resource manage	ement, protect the enviro	onment and develop	
Course Contents		ne environment				
& Topics		cepts of Environmental E	Economics			
-	- Identifica	ation of and engagement	with relevant stakeholders			
		management for land, a	ir, water and biomass			
		nent of waste				
		Energy policies and economics				
0		lanning and regulations for a sustainable future				
Course Learning Outcomes		On successful completion of this course, students should be able to: CLO 1 demonstrate knowledge and critical understanding of the complexity and interconnect				
Outcomes	hı	uman society and the nat	ural environment	omplexity and interconn	ectedness between	
			and misuse of natural resources			
			and policies for solving environme			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in o	ne of the following course	es: CHEM2041, EASC2404, ENVS2	2001 or ENVS2002		
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20	22 : Y	Examination	Dec	
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery of the course material. Show strong ability for analytical, critical and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Demonstrate highly effective organizational and presentational skills.					
	В					
	C Demonstrate general but incomplete command of the course material and an ability to apply knowledge to most familiar situations. Show evidence of some critical and logical thinking abilities. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of the course material and a limited ability to apply knowledge to solve problems. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply limited or barely effective organizational and presentational skills.				
	Fail Demonstrate little or no evidence of command of course material with very little or no ability to apply knowledge to solv problems. Lack of critical thinking abilities and incoherent thinking. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture-b	ased course				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Lectures		12 sessions of 2 hrs		24	
	Project w	ork			12	
	Discussion	on	Interactive learning		24	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examinat	tion		40	CLO 1,2	
	Project re			60	CLO 1,2,3	
Required/recommended reading and online materials	Tietenber Keller and Kaufmann	g and Lewis: Environmer d Botkin: Essential Environ n and Cleveland: Environ	ntal economics and policy nmental Science (John Wiley & So mental Science (Amazon, 2008)			
Additional Course			An Introduction to Environmental Is:	sues (Amoid, 1999)		
Additional Course Information		course code: ENVS2004 ory to 4-year students				

ENVS3019	Urban ed	cology (6 credits)	Academic Year	2020		
Offering Department	Biological	Sciences	Quota	75		
Course Co-ordinator	Dr T C Bor	nebrake, Biological Sciences (tbone@hku.hk)				
Teachers Involved						
Course Objectives		e will provide students with an understanding and knowledge of highlight the role of cities in a world under environmental change				
Course Contents & Topics	concepts developme effects), in	Ecological systems within cities and cities as ecological systems will both be covered in this course. Ecological concepts unique to or specialized within cities will be covered including sustainability, conservation, health, development, globalization, and restoration. Specific topics will include climate change (e.g. urban heat island effects), invasive species, infectious diseases and pollution. Examples will be taken globally but special emphasis will be placed on Hong Kong.				
Course Learning		sful completion of this course, students should be able to:				
Outcomes	CLO 1 describe and evaluate the processes and patterns that characterize urban ecological systems					
	CLO 2 understand biodiversity and ecosystem responses to urbanization					
	CLO 3 recognize energy flows within urban ecosystems and how energy use and waste improve or deteriorate environmental quality					
		tically evaluate management and policy solutions to urban ecologic	cai problems			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Bi	OL2306 or ENVS2001 or ENVS2002				
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : Y	Examination			
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all course learnin outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, ability to integral and synthesize information, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. App highly effective presentational skills. Strong evidence of clear attention to thoughtful and reflective thinking.				
	В	0 7 1				
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most					

		familiar situations. Apply moderately effective presentational skills. Little evidence of clear attention to thoughtful and reflective thinking.					
	D	Show evidence of some of	quired for attaining some of the nited analytical and critical abi Apply limited effectiveness in pro-	lities and little attempt at			
	Fail	of analytical and critical a	temonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcom f analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge roblems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-b	ased course					
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading / Self study			100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examinat	tion	Mid-term exam (20%), Final exam (30%)	50	CLO 1,2,3,4		
	Presenta	tion	i i	20	CLO 1,2,3,4		
	Project re	eports		30	CLO 1,2,3,4		
Required/recommended reading and online materials	Niemela and Applie Reference	Textbooks: Niemela J, Breuste JH, Elmqvist T, Guntenspergen PJ, McIntyre NE (2011) Urban Ecology: Patterns, Processes, and Applications. Oxford University Press, Oxford. References: Gaston KJ (2010) Urban ecology. Cambridge University Press, Cambridge.					
Course Website		odle.hku.hk	, ,	<u> </u>			
Additional Course Information		This course will be offered subject to a minimum enrollment number and availability of teachers. Offer in alternate year from 2013-2014					

ENVS3020	Global	change ecology (6 credits)	Academic Yea	ar 2020	
Offering Department	Biologica	l Sciences	·	Quota	65	
Course Co-ordinator	Dr C Ding	Dr C Dingle, Biological Sciences (cdingle @hku.hk)				
Teachers Involved	(Dr C Dingle,School of Biological Sciences)					
Course Objectives	The main goal of this course is to introduce students to the ways in which global environmental change affects biodiversity from organisms to ecosystems. This course will explore the contributions that human population growtl and globalization have made to increases in greenhouse gases and associated climate change, biological invasions, land degradation, disease, and, ultimately, impacts on biological systems.					
Course Contents & Topics	disappea natural va focus prin topics re- synergisti how it is i use chan investigat organism	Environmental change is a natural phenomenon, with ecosystems continually shifting, rearranging, emerging, and disappearing through geologic time with changes in climatic conditions. The activities of humans have added to this natural variation, increasing the magnitude and speed with which environmental change occurs. This course wil focus principally on the effects of climate change on organisms and ecosystems but will also investigate other topics registering on a global scale including land use change, biological invasions, and pollution, as well as synergistic interactions between all of the environmental stressors. We will explore (1) what climate change is and how it is manifested including climate warming, sea level rise, and ocean acidification; (2) types and extents of land use change; (3) how globalization has contributed to the spread of alien species and disease. The course will investigate how these human-caused stressors affect the morphology, phenology, distribution, and evolution or organisms and their impacts on ecosystem functioning and biodiversity in freshwater, marine, and terrestrial ecosystems.				
Course Learning			nis course, students should be abl	e to:		
Outcomes					s such as land use	
	CLO 1 develop a basic understanding of climate change and other human-associated impacts, such as land use change, and how they are manifested on a global scale					
	CLO 2 explain the ways that global change affects organisms' traits and distributions, and biodiversity at the					
	ecosystem level					
	CLO 3 understand the differences between climate change on a geologic time scale and recent climate change					
	CLO 3 understand the differences between climate change of a geologic time scale and recent climate change.					
Pro-requisites	Page in B	RIOL 2306 or ENVS20		al change		
	Pass in B	BIOL2306 or ENVS20		al change		
(and Co-requisites	Pass in B	BIOL2306 or ENVS20		al Glange		
(and Co-requisites and Impermissible	Pass in B	BIOL2306 or ENVS20		al Change		
(and Co-requisites and Impermissible combinations)			01 or ENVS2002	- V	No Exam	
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)		d sem Offer in 2021 Demonstrate thorough outcomes. Show strong and synthesize informa	01 or ENVS2002 I - 2022 : N mastery at an advanced level of extensive analytical and critical abilities and logication, and ability to apply knowledge to a v	Examination e knowledge and skills required for atta al thinking, with evidence of original tho wide range of complex, familiar and unf	ught, ability to integrate amiliar situations. Appl	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 2n	d sem Offer in 2021 Demonstrate thorough outcomes. Show strong and synthesize informa highly effective presentate bemonstrate substantia learning outcomes. Sho	01 or ENVS2002 I - 2022: N mastery at an advanced level of extensive go analytical and critical abilities and logication, and ability to apply knowledge to a vational skills. Strong evidence of clear atteal command of a broad range of knowled ow evidence of analytical and critical abil miliar and some unfamiliar situations. E	Examination e knowledge and skills required for atta al thinking, with evidence of original tho wide range of complex, familiar and unf ntion to thoughtful and reflective thinking ge and skills required for attaining at le tities and logical thinking, integration of	ining all course learning ught, ability to integrate amiliar situations. Apply 3. east most of the course materials and ability to	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 2nd	d sem Offer in 2021 Demonstrate thorough outcomes. Show strong and synthesize informa highly effective present. Demonstrate substantia learning outcomes. Sho apply knowledge to fa attention to thoughtful a Demonstrate general boutcomes. Show evide familiar situations. Appl thinking.	01 or ENVS2002 I - 2022: N mastery at an advanced level of extensive an analytical and critical abilities and logication, and ability to apply knowledge to a vational skills. Strong evidence of clear atteral command of a broad range of knowled ow evidence of analytical and critical abil miliar and some unfamiliar situations. End reflective thinking, but incomplete command of knowledgence of some analytical and critical abilitie by moderately effective presentational skil	Examination e knowledge and skills required for atta al thinking, with evidence of original tho wide range of complex, familiar and unf tion to thoughtful and reflective thinking ge and skills required for attaining at le ities and logical thinking, integration of bemonstrate effective presentational sl and skills required for attaining most es and logical thinking, and ability to ap ls. Little evidence of clear attention to te	ining all course learnin- ught, ability to integrate amiliar situations. Appl 3. sast most of the course materials and ability to kills. Evidence of clear of the course learning pply knowledge to moshoughtful and reflective	
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	Project work	Problem-based exercises		20
	Reading / Self study			100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments	problem-based exercises (10%), continuous assessment (10%), assignments (30%)	50	CLO 1,2,3,4
	Test	Mid-term test	50	CLO 1,2,3,4
Required/recommended reading and online materials	Lovejoy, T.E. and Hannah, L. 200 Newman et al. 2011. Climate Cha Required articles: Araujo, M.B., and Rahbek, C. 200 Grimm, N.B., Faeth, S.H., Golubi and the ecology of cities. Science Schlesinger, W.H. 2006. Global of	15. Climate Change and Biodiversity. Yange Biology. CAB International, Oxford 16. How does climate change affect bio 16. ewski, N.E., Redman, C.L., Wu J., Bai 16. a 319:756-760. 17. hange ecology. Trends in Ecology and	d,UK. diversity? Science 313:1 , X., and Briggs, J.M. 20	396-1397.
Course Website	http://moodle.hku.hk/			
Additional Course Information	This course will be offered subject Offer in alternate year from 2016-	t to a minimum enrollment number and 2017	availability of teachers.	

	Offer in al	ternate year from 2016-2	2017				
ENVS3022	Environ	mental science field	I course (6 credits)	Academic Year	2020		
Offering Department	Biological	10					
Course Co-ordinator	Dr M Yası	Dr M Yasuhara, Biological Sciences (yasuhara@hku.hk)					
Teachers Involved	(Dr C Ding	(Dr C Dingle, Biological Sciences)					
		(Dr M Yasuhara,Biological Sciences)					
Course Objectives		To provide students experiential learning experience in the field of environmental science. The cours based on an array of experiential studies covering essential areas of environmental science during					
		an array of experiential	l studies covering essential are	as of environmental science d	uring a residential		
	fieldtrip.						
Course Contents			eld trip outside Hong Kong to le				
& Topics	residential field trip may include marine environmental survey, sediment core sampling, practical learning of ecological, paleoecology and environmental problems, environmental geology/paleontology excursion, and other						
			write an independent report on	0 0, . 0,			
Course Learning			course, students should be able		id trip.		
Outcomes	CLO 1	· · · · · · · · · · · · · · · · · · ·	vironmental science in practice				
	CLO 2		rrent environmental problems ar	nd solutions			
	CLO 3		cate their field observations and				
Pre-requisites		NVS2001 or		99			
(and Co-requisites			urrently enrolled in ENVS2002				
and Impermissible			•				
combinations)							
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : Y		Examination			
Grade Descriptors	Α		p of the subject. Show strong analytic				
(A+ to F)			ly effective lab / fieldwork skills and ted		ts to draw appropriate		
	В	and insightful conclusions. Apply highly effective organizational and presentational skills. B Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Apply effective lab /					
	fieldwork skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and						
	presentational skills.						
	C Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective lab / fieldwork skills and techniques. Mostly correct but some erroneous use of data and results to						
	draw appropriate conclusions. Apply moderately effective organizational and presentational skills.						
	D Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and						
		logical thinking, but with limited analytical and critical abilities. Apply partially effective lab / fieldwork skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and					
		Limited ability to use data	and results to draw appropriate concl	usions. Apply limited or barely effective			
		presentational skills.			ve organizational and		
	Fail	presentational skills. Demonstrate evidence of li	ttle or no grasp of the knowledge and	d understanding of the subject. Evider	ve organizational and		
	Fail	presentational skills. Demonstrate evidence of li analytical and critical abilitie	ttle or no grasp of the knowledge and es, logical and coherent thinking. Appl	d understanding of the subject. Evider by minimally effective or ineffective lab	ve organizational and nce of little or lack of / fieldwork skills and		
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Course Teaching & Learning Activities Assessment Methods and Weighting Course Website Additional Course	Laboratory Activities Field work Reading / Methods Laborator Presentat Project re http://www Enrollmen quota set. to Dr M Ya semester The propocourse; (2	presentational skills. Demonstrate evidence of li analytical and critical abilitical and critical abilitical techniques. Misuse of data a minimally effective or ineffect y and workshop course of the study. Yes Self study Yes reports sion ports Jobiosch.hku.hk/ecology/ tt Procedure: The actua So, interested student resultant (yasuhara@hku.course, but we need appeal should include the self-self-self-self-self-self-self-self-	title or no grasp of the knowledge and es, logical and coherent thinking. Appl and results and/or unable to draw approcitive. Details Students will take part in at I and other learning 66 hours Details field reports group presentations individual report Isc/ I capacity of this course is limit must apply for the course with a u.hk) and Ms. Maria Lo (gylo@hoplications well in advance, by to following: (1) specific reason(s) to receive from this course, etc.	d understanding of the subject. Evider by minimally effective or ineffective lab popriate conclusions. Organization and p east 66 hours of field trips Weighting in final course grade (%) 30 30 40 ted and will vary year by year, short proposal (2 pages max.) sku.hk) not later than 1st Augus this date). Late applications will /motivation why you are interest especially regarding your future	No. of Hours No. of Hours 66 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1		
Course Teaching & Learning Activities Assessment Methods and Weighting Course Website Additional Course	Laboratory Activities Field work Reading / Methods Laborator Presentat Project re http://www Enrollmen quota set. to Dr M Ya semester The propocourse; (2 path; (3) t	presentational skills. Demonstrate evidence of li analytical and critical abilitical and critical abilitical techniques. Misuse of data a minimally effective or ineffect y and workshop course of the strategy o	title or no grasp of the knowledge and es, logical and coherent thinking. Appl and results and/or unable to draw approtive. Details Students will take part in at I and other learning 66 hours Details field reports group presentations individual report I capacity of this course is limit must apply for the course with a Luk) and Ms. Maria Lo (gylow) and Ms. Maria Lo (gylow) following: (1) specific reason(s) to receive from this course, elemic interests. The CV should	d understanding of the subject. Evider by minimally effective or ineffective lab spriate conclusions. Organization and post east 66 hours of field trips Weighting in final course grade (%) 30 30 40 ted and will vary year by year, short proposal (2 pages max.) sku.hk) not later than 1st Augus this date). Late applications will /motivation why you are interest specially regarding your future include: (1) Personal & acade	No. of Hours No. of Hours 66 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1		
Course Teaching & Learning Activities Assessment Methods and Weighting Course Website Additional Course	Laboratory Activities Field work Reading / Methods Laborator Presentat Project re http://www Enrollmen quota set. to Dr M Y: semester The propoc course; (2 path; (3) b photograp	presentational skills. Demonstrate evidence of li analytical and critical abiliti techniques. Misuse of data a minimally effective or ineffect y and workshop course is k. Y Self study Ty reports J	title or no grasp of the knowledge and es, logical and coherent thinking. Appl and results and/or unable to draw approcitive. Details Students will take part in at I and other learning 66 hours Details field reports group presentations individual report Isc/ I capacity of this course is limit must apply for the course with a u.hk) and Ms. Maria Lo (gylo@hoplications well in advance, by to following: (1) specific reason(s) to receive from this course, etc.	d understanding of the subject. Evider by minimally effective or ineffective lab opriate conclusions. Organization and posterior conclusions. Organization and posteri	ve organizational and noe of little or lack of / fieldwork skills and resentational skills are No. of Hours 66 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3 CLO 1,2,3 regardless of the and CV via e-mail t (Note: this is 2nd I not be accepted sted in joining this e academic/career mic details; (2) ID		

The residential field trip will be organized in the reading week. Students will need to pay for their own travel cost for the trip (please contact us for details & financial difficulty). It will be good to take this course before taking the final year project to have relevant hands-on experience. This course will be offered subject to a minimum enrollment no. and availability of teachers.

Offering Department Course Co-ordinator		Sciences		CHOta			
		atagan Distant 10 t	Quota	O			
Teachers Involved	Biological Sciences Quota 8 Dr T Vengatesen, Biological Sciences (rajan@hku.hk) (Dr T Vengatesen, School of Biological Sciences) (Prof G A Williams, School of Biological Sciences)						
Course Objectives		- Understand the primary drivers of biodiversity and ecosystem function in rocky intertidal, mangrove and coral reef					
Course Objectives	ecosystems in USA and SE Asia.						
	and stress	from pollution	rban ecosystems in this region are bei	,			
	and/or fac	ilitate coastal adaptatic			Ū		
			ices such as seafood preferences an pacts coastal biodiversity	d traditional medicine a	affect harvesting of		
Course Contents			pulation now lives in coastal cities,				
k Topics	resources, but are also experiencing ever increasing threats from the ocean environment. This program we the mechanisms by which coastal communities in the US and SE Asia are facing these expanding chaincluding their impacts on coastal ecosystems. Using a comparative approach, students will explore the challenges facing coastal societies, and will gain an in-depth understanding of coupled human-natural sy the coasts of New England and Southeast Asia (Hong Kong and Malaysia). By comparing and contrasting both ecosystems and societies, students will develop an appreciation for commonalities of challenges facing the world's coasts, as well as differences that occur due to local experiences.						
	major emp	phasis of the program or climate change ada	will be on solutions, and how by taki ptation that span traditional cultural bar in Hong Kong, Malaysia and the Gulf	ng a global perspective riers. We will blend stud	we can accelerate ies of threats facing		
			t) enacted solutions to those challenge				
Course Learning Outcomes			course, students should be able to: nd differences between how coupled l	numan-natural systems	operate in SE Asia		
		d in comparable habita eading and synthesizir	ats in the U.S.A. ng review articles in the primary litera	ture in marine science	and social science		
		· · ·	e connections among these diverse app				
	CLO 3 Articulating arguments about how traditional Chinese, Malaysian and American culture affect human impacts on the environment, and to develop potential solutions to these issues based on conversations with peers						
	CLO 4 Be		collaborating with peers from U.S.A,	and gain a greater und	derstanding of the		
re-requisites			or BIOL3305 or BIOL3318 or ENVS200	1 or FNVS2002 or FAS	C3020		
and Co-requisites and Impermissible combinations)				, , , , , , , , , , , , , , , , , , , ,	00020		
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : Y		Examination			
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a complex issue of sustainable coastal management in economically and socially developed and developing places.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to a complex issue of sustainable coastal management in economically and socially developed and developing places						
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to a complex issue of sustainable coastal management in economically and socially developed and developing places.						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply						
	Fail		ms. ridence of command of knowledge and skills req pilities, logical and coherent thinking. Show very				
Course Type	Field cam						
Course Teaching	Activities		Details		No. of Hours		
Learning Activities	Lectures				40		
	Field work				80		
,	Laborator	y work	including hands on training		30		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	nts	Write ups form the field trips	20	CLO 1		
	Report		Final lab notebook and associated materials (video diaries and	50	CLO 2,3,4		
	Test		photos)	30	CLO 2,3,4		
Course Website		dle.hku.hk/	1		220 2,0,1		
Additional Course		around July 9, 2021 to	o August 10, 2021				
nformation	- All field to		seas trip to Malaysia and USA, are cor	npulsory			
	2nd week:	Lectures and field trip	d field trips in the University of Hong K s in University Sains Malaysia, Penang field trips in Northeastern University, N	(Malaysia)	SV)		

This is an introductory overseas experiential learning course designed for all science students as free elective. it is especially suitable for students aiming to major in environmental science, ecology & biodiversity or biological sciences.

"Note: Field trips in New England (Boston, USA) will NOT be considered for assessment and, therefore, those field trips in USA are only exploratory in nature and are NOT part of any HKU's credit bearing course".

ENVS3202	Plant ph	ysiology and clima	te change (6 credits)	Academic Ye	ar 2020			
Offering Department	Biological	50						
Course Co-ordinator		Or J Wu, Biological Sciences <i>(jinwu@hku.hk)</i>						
eachers Involved		(Dr J Wu,Biological Sciences) In this course students will learn different quantitative methods for measuring and evaluating climate change						
Course Objectives	impacts o micromete the "breatl canopy, a of materia	impacts on terrestrial ecosystems. This interdisciplinary course draws on aspects of plant physiology ecology, micrometeorology and ecosystem ecology to describe impacts and patterns of global change. We will explore how the "breathing" of the biosphere impacts and is impacted by climate change by scaling plant physiology from leaf to canopy, and ultimately to global scales. Students will examine the biophysical processes that affect the exchange of material (water, CO2, and atmospheric trace gases) and energy between terrestrial biosphere and the atmosphere. In addition, students will learn cutting-edge techniques to help monitor, model and diagnose these						
Course Contents & Topics	1. Overvir Fundamen transpirati 3. Introduc plant meta etc). 4. Case	1. Overview of plant physiology, with particular focus on the interactions between plants and climate. 2. Fundamental biophysical principles that regulate the strengths of ecosystem metabolism (i.e. photosynthesis, transpiration and etc). 3. Introduction to various remote sensing and modelling approaches to quantify the impacts of climate variability on plant metabolism (e.g. proximate and satellite remote sensing, ecosystem modelling, biological scaling processes,						
Course Learning	On succes	ssful completion of this of	course, students should be able to:					
Outcomes	CLO 2 un	derstand how to access namics in plant metabo	tal principles that regulate terrestria s satellite data and how to utilize sa lism scientific understanding of plant p	tellite data to map and und				
			environmental problems associated					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BI Priority w Science.	OL2306 or ENVS2001 of the control of	or ENVS2002 or EASC2404. s majoring in Environmental Scie	nce, Biological Science,	and Earth System			
Offer in 2020 - 2021		sem Offer in 2021 - 20		Examination	Dec			
Grade Descriptors (A+ to F)	Demonstrate thorough mastery of the course material. Show strong ability for analytical, critical and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Demonstrate highly effective organizational and presentational skills. B Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and some unfamilia situations. Show evidence of analytical, critical thought to some complex issues. Apply effective organizational and presentational skills.							
	С	Demonstrate general but incomplete command of the course material and an ability to apply knowledge to most familiar situations. Show evidence of some critical and logical thinking abilities. Apply moderately effective organizational and presentational skills.						
	D	Demonstrate partial but limited command of the course material and a limited ability to apply knowledge to solve problems. St evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply limited or barely effect organizational and presentational skills.						
	Fail Demonstrate little or no evidence of command of course material with very little or no ability to apply knowledge to solve problems. Lack of critical thinking abilities and incoherent thinking. Organization and presentational skills are minimally effective or ineffective.							
Course Type		th laboratory componer						
Course Teaching	Activities		Details		No. of Hours			
Learning Activities	Lectures			24				
	Laborator	у			12			
	Tutorials	Solf study			12			
Noncompant Mathematic		Self study	D. C. T.	141 1 1 41 1 41 1	90			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments		home work (20%) and lab. assignment (20%)	40	CLO 1,2,3			
	Examination		Mid term Exam. (20%), Final Exam. (30%)	50	CLO 1,2,3			
	Presentat		In-class presentation	10	CLO 1,3			
Course Website		dle.hku.hk/						
Additional Course Information	momentur atmosphe course co	m, energy and material re. Key instrumentation	be assessed by examining the bic (water, CO2, and atmospheric trace and associated multi-scale measur covered in EASC3405 Environme taken EASC3405.	e gases) between terrestricements of this course are	al biosphere and the also discussed. This			

ENVS3401	Understanding tropical ecosystems in a changing world (6 credits)	Academic Year	2020
Offering Department	Biological Sciences	Quota	20
Course Co-ordinator	Dr A L Ashton, Biological Sciences (lashton@hku.hk)		
Teachers Involved	(Dr A L Ashton,Biological Sciences) (Dr C Dingle,Biological Sciences) (Dr T Bonebrake,Biological Sciences)		

Additional Course Information	This is a	n overseas experie	ential learning course designed for ENVS ble for students aiming to major in enviror	•			
Course Website	Test	odle.hku.hk	the field camp, based on the research proejct	30	CLO 1,2,3		
	Report		research carried out on the field course Oral presentation: Prentation during	50	CLO 1,2,3,4		
	Assignme	ents	Field journal: Students will create a natural history field journal, with scientific drawings and observations Journal-style paper based on the	20	CLO 2		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
		/ Self study	Preparation of report after the field tri		40		
	Presentation		Presentation during the field camp, b proejct	5			
	Tutorials		Lectures/workshops during field trip	Lectures/workshops during field trip Presentation during the field camp, based on the research			
	Laborato	ry work	Lab work during the field trip				
9	Field wor	k	10 days field work experience		40		
Learning Activities	Lectures	•	Briefing at HKU on field course activity	ties	No. of Hours		
Course Type Course Teaching	Field cam Activities		Details		No. of Hours		
Name Town	Fail	demonstration of ana knowledge of the natu scientific paper.	oo evidence of command of knowledge and skills req lytical and critical abilities and logical thinking, wit rral history of a tropical rainforest, ecological studies	h evidence of original thou	ht. Not able to appl		
	D	that communicates your results. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcome Show some analytical and critical abilities and logical thinking, but not original thought. Limited ability to use knowledge of nature history of a tropical rainforest and ecological studies to conservation ecology. Produce a scientific paper that communicates yo results. Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. No					
	С	outcomes. Show some analytical and critical abilities and logical thinking, with evidence of original thought. Able to apply some knowledge of the natural history of a tropical rainforest and ecological studies to conservation ecology. Produce a scientific paper					
	В	high enough quality for publication. Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show very good analytical and critical abilities and logical thinking, with evidence of original thought. Ability to apply knowledge of the natural history of a tropical rainforest and ecological studies to conservation ecology. Produce a well					
Grade Descriptors (A+ to F)	A Demonstrate an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought. Ability to apply knowledge of the natural history of a tropical rainforest and ecological studies to conservation ecology. Produce a scientific paper that is written a						
combinations) Offer in 2020 - 2021	N Off	fer in 2021 - 2022 : Y	(Examination			
Pre-requisites and Co-requisites and Impermissible	Pass in ENVS2001 or ENVS2002 or BIOL2306						
	CLO 3 work collaboratively to design and carry out a research project (collect and analyze data and results) on an ecological or environmental topic CLO 4 carry out a range of field sampling and observational techniques for collecting data in the field						
Outcomes	CLO 1 de	emonstrate an und onservation	lerstanding of the importance of ecolog impacts of human activity on tropical rainform		ry knowledge for		
Course Learning	conservat	conservation efforts. Students will work in groups to conduct research projects which will tie together the learned through the lectures and field trips On successful completion of this course, students should be able to:					
	rainforest measures field resea impact of Valley, a	ecosystems, inves s which can help miti arch projects, and al human activities in primary tropical rai	inition a series of lectures, titionals and ristingate the environmental impacts of lancing it in the importance of data generated from such important ecosystems. The bulk of inforest located in Sabah, Malaysia. We plantations, to observe how land-use change.	I use change, and dis n techniques for designi n research to inform effor the course will be car will visit some sites in	cuss conservation ng and carrying or orts to minimize the ried out in Danur npacted by huma		
Course Contents & Topics	Tropical services anthropog	rainforests are the such as nutrient of genic pressure due to tion efforts over the	most biologically rich terrestrial ecosys- cycling, carbon storage and new medic to logging, burning and conversion to agric next few decades are essential if we are through a series of lectures, tutorials and f	cines. Rainforests are ulture, as well as climat to slow down our imp	under increasing e change. Effectiv acts on these vit		
	In this field course, students will learn how to use natural history and ecology to answer important environment questions relevant to tropical ecoystems. Through field studies in both degraded and prisitine habitats, students gain an understanding of the major drivers of ecosystem change and biodiversity loss in a tropical landscape Sabah, Borneo and learn about measures to mitigate the impacts of human activities in these vital ecosystem Students will work in groups to develop and carry out a research project to address ecological or environment questions. After the field portion of the course, students will write up the results of their projects in the style of scientific paper.						

ENVS3402	Qualitative data, social science methods and decision- making in environmental science (6 credits)	2020	
Offering Department	Biological Sciences	Quota	30
Course Co-ordinator	Dr Hannah Mumby, Biological Sciences (hsmumby@hku.hk)		
Teachers Involved	(Dr Hannah Mumby,Biological Sciences)		

Course Objectives	begin with environment introduce methodolo focus groumedia and and what	h an introduction to ental sciences. The ogies and methods. ups, surveys, and q alysis. Attention will analyses are used.	the historical context and percourse will then take a case. These include the collection a uestionnaires to ethnographic abe paid to suitability of metho	oproaches in environmental scier shilosophical background to diffee study-based approach, using and analysis of qualitative and quapproaches, grounded theory, disds to research questions, how steese data are or can be integrated n-making.	erent approaches to the case studies to uantitative data from scourse analysis and udies are conducted	
Course Contents & Topics	-Research -Concepts -Methodo -Methods tools.					
Course Learning Outcomes	CLO 1 D CLO 2 D CLO 3 D sc	successful completion of this course, students should be able to: O 1 Determine and distinguish a range of social science approaches and qualitative data analysis techniques O 2 Design a study appropriate for the research question using those approaches and techniques O 3 Discuss the philosophical and epistemological background of different approaches to environmental science questions O 4 Critically evaluate studies using social science and/or qualitative approaches.				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	NVS2002				
Offer in 2020 - 2021	Y 2nd	d sem Offer in 202	1 - 2022 : Y	Examination	May	
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery of the course material. Show strong ability for analytical, critical and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Demonstrate highly effective organizational and presentational skills. B Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and some unfamiliar situations. Show evidence of analytical, critical thought to some complex issues. Apply effective organizational and					
	C D	presentational skills. Demonstrate general but incomplete command of the course material and an ability to apply knowledge to most familiar situations. Show evidence of some critical and logical thinking abilities. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of the course material and a limited ability to apply knowledge to solve problems. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply limited or barely effective organizational and presentational skills.				
	Fail Demonstrate little or no evidence of command of course material with very little or no ability to apply knowledge to solve problems. Lack of critical thinking abilities and incoherent thinking. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture-b	ased course				
Course Teaching	Activities	S	Details		No. of Hours 36	
& Learning Activities	Lectures					
	Tutorials		Lab sessions		12	
		/ Self study			100	
Assessment Methods and Weighting	Methods	.	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme Examinat			60 40	CLO 1,2,3,4 CLO 1,2,3,4	
Required/recommended reading and online materials	Methods i making, V Moon et a methodok Mukherjee	in Ecology and Evolu /olume 9, Issue 1, pp al. (2019) Expanding ogy, and methods. M e et al. (2019) Respo	o 1-206. This entire special issug the role of social science in c Methods in Ecology and Evolution onse to Expanding the role of s	rualitative methods for eliciting jud the contains papers on the topic. conservation through an engagem	gements for decision nent with philosophy, ough an engagement	

ENVS4110	Environmental remediation (6 credits)	Academic Year	2020				
Offering Department	Biological Sciences	Quota	30				
Course Co-ordinator	TBC, Biological Sciences ()						
Teachers Involved	(TBC,Biological Sciences)						
Course Objectives	To introduce students with the environmental fate information of different pollutants/contaminants in the environment To understand the technologies available for environmental remediation of pollutants in soils and water, and the characteristics of each techniques relevant to the pollutants of concern To learn the fundamental physical, chemical and biochemical reactions involved in the remediation process To obtain skills for critical analysis of the recent technological development and the proposed applications						
Course Contents & Topics	Understanding the types of different pollutants and their fate in the envir aquatic; and relevant strategy of pollution control and treatment; advanced phytoremediation; mechanisms of biochemical transformation of polya biphenols, agrichemicals and phthalate esters as well as both metals and the specific genes involved in detoxification; chemotaxis and engineering	To obtain skills for critical analysis of the recent technological development and the proposed applications. Understanding the types of different pollutants and their fate in the environments including both terrestrial and aquatic; and relevant strategy of pollution control and treatment; advanced oxidation, microbiological treatment and phytoremediation; mechanisms of biochemical transformation of polyaromatic hydrocarbon, polychlorinated biphenols, agrichemicals and phthalate esters as well as both metals and metalloids; biochemical pathways and the specific genes involved in detoxification; chemotaxis and engineering the degradation pathways in bacteria; transport of microorganisms and monitoring in subsurface environment; survival of introduced organisms; evolution					
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 explain the remediation technologies available to the type of pollutar	nts of concern in remed	diation practice				
	CLO 2 propose remediation strategies for polluted sites with the best technology of pollutants and the cost involved	nologies available con	sidering the type				
	CLO 3 differentiate the technologies available for the specific pollutants and the fundamental process involved in terms of the catalysts and the effectiveness						
	CLO 4 describe several key chemical and biochemical processes use	d in environmental re	emediation with				

		dequate background info			t		
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in BIOL3109 or BIOL3110 or BIOL3401 or ENVS3042					
Offer in 2020 - 2021		er in 2021 - 2022 : Y			Examination		
Grade Descriptors (A+ to F)		A Thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Thorough grasp of the subject matter. Show very strong analytical and critical abilities and high logical thinking, with evidence of original thought. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.					
		B Substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Substantial grasp of the subject. Show evidence of analytical and critical abilities and logical thinking. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	С	General but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. General but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	D						
	Fail Little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture w	ith laboratory componer	nt course		•		
Course Teaching	Activities	S	Details			No. of Hours	
& Learning Activities	Lectures					24	
	Laboratory					8	
	Field work					6	
	Project work					6	
	Tutorials					4	
	Reading	/ Self study				100	
Assessment Methods and Weighting	Methods		Details		Veighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents			10	CLO 1,2,3,4	
	Examinat	tion			50	CLO 1,2,3,4	
	Laborator	ry reports			25	CLO 1,2,3,4	
	Presentat	tion			10	CLO 1,2,3,4	
	Test				5	CLO 1,2,3,4	
Required/recommended reading and conline materials	S.C. McC	t: Manual of Environmen utcheon & J.L. Schnoor: ll & J-D Gu: Environmen	: Phytoremediation: T	ransformation and (Control of Contamina	ınts (Wiley)	
Course Website		odle.hku.hk/	5, (,	,		
Additional Course Information	The cours	se will be offered subject		ment number and a	vailability of teachers		

CAES1000	Core Un	niversity English (6 c	credits)	Academic Yea	ar 2020		
Offering Department	English			Quota			
Course Co-ordinator	Dr P Won	ig, English (pmtw2@hku.	.hk)				
Teachers Involved	(Dr P Wor	ng,Centre for Applied Eng	glish Studies)				
Course Objectives							
Course Contents & Topics	proficienc Common written ac for and us the Mood skills and students to	The Core University English (CUE) course aims to enhance first-year students' academic English language proficiency in the university context. CUE focuses on developing students' academic English language skills for the Common Core Curriculum. These include the language skills needed to understand and produce spoken and written academic texts, express academic ideas and concepts clearly and in a well-structured manner and search for and use academic sources of information in their writing and speaking. Four online-learning modules through the Moodle platform on academic speaking, academic grammar, academic vocabulary, citation and referencing skills and avoiding plagiarism will be offered to students to support their English learning. This course will help students to participate more effectively in their first-year university studies in English, thereby enriching their first-year experience.					
Course Learning			ourse, students should be able to	•			
Outcomes	CLO 1 id	entify and distinguish b	etween main ideas and support ding of the arguments / facts expr	ing details in lectures and	written texts and		
	CLO 2 fo	rm and express persona	I opinions through critical reading	and listening			
		rgue for and defend a pos peaking	sition in a clear and structured wa	y using academic sources,	through writing and		
	_	emonstrate control of gra	mmatical accuracy and lexical ap	propriacy in academic comr	nunication		
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL	NIL					
Offer in 2020 - 2021	Y 1st	sem 2nd sem Offer i	in 2021 - 2022 : Y	Examination	No Exam		
Grade Descriptors (A+ to F)	A	appropriately structured. Structured. Structured. Structured structured position. Students always ureference correctly at all times.	isult. Students are able to produce spo udents can clearly and concisely explai- use appropriate academic sources to su- nes. Students demonstrate an ability to fu- tains very few, if any, systematic errors	n academic concepts and critical oport their ideas in writing and s lly comprehend and critically inter	ly argue for a detailed peaking. They cite and pret spoken and written		
	В						
	С	Satisfactory to reasonably structured but there is some concepts. While they can a sometimes use sources whit some systematic errors in comprehending and critically views and attitudes. Written grammar and vocabulary an	good result. Spoken and written acader e evidence of this ability. Students are soi trigue for a position, it is not very detaile ch are nonacademic and/or not approprial citation and referencing but also evidence y interpreting texts. They can always und I anguage is sometimes inaccurate, althe d there is some evidence of control of sin	nic texts produced by students a netimes unable to clearly and con d and tend to be simplistic rathe te to support their ideas in writing of correct systematic use. Stude erstand the main ideas but may no pugh errors, when they occur, are	are sometimes not-well cisely explain academic r than critical. Students and speaking. There are nts have some difficulty hiss some of the writer's more often in complex		
	D Barely satisfactory result. Spoken and written academic texts produced by students are often inappropriately structured but there may be some evidence of this ability. Students are often unable to clearly and concisely explain academic concepts and argue for a position. There is some evidence of an ability to explain academic concepts but not to critically argue for a position. Students often use sources which are nonacademic and/or not appropriate to support their ideas in writing and speaking. There are many systematic errors in citation and referencing however there is evidence of an understanding of some of the conventions of citation and referencing. Students often have difficulty comprehending and interpreting texts, sometimes failing to understand the main ideas and writer's views and attitudes. Written language is often inaccurate containing errors in a range of simple and complex grammar and vocabulary. Spoken language is only sometimes comprehensible and fluent, and strain is frequently placed on the listener.						
	Fail	are unstructured and uncleasentence. Spoken language	ctive skills are too limited to be able to suc ar. Students are unable to follow and in is often incomprehensible. Assessments i	terpret texts. There are language	errors in almost every		
Course Type		ased course					
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures				30		
	Tutorials				6		
	Reading	/ Self study					
	r tcauring .	/ Jeli study			84		
Assessment Methods and Weighting	Methods	·	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		

CAES9820		ic English for	science students (6 credits)	Academic Yea	r 2020		
Offering Department	English			Quota			
Course Co-ordinator		oynton, English <i>(sl</i>					
Teachers Involved			Applied English Studies)				
Course Objectives	skills for d science ar presenting spoken co	This 6-credit English-in-the-Discipline course aims to develop students' professional and technical communication skills for disciplinary studies in the sciences. There are three main components in the course: 1) Writing a popular science article 2) An oral presentation and 3) Independent language learning. Students will learn rhetorical skills for presenting and explaining scientific concepts to a cross-disciplinary and non-specialist audience in both written and spoken communication. Students will also be given an opportunity to design a personalised language learning plan, carry out the plan and reflect on their own independent language learning experience.					
Course Contents		vered in the cours		5 !			
& Topics	- Finding, - Compilin - Contrast - Writing fo - Organiz grammar; - Critically	Finding, evaluating and using appropriate academic source materials; Compiling an academic bibliography; Contrasting academic and popular genres of Science; Writing for a specific audience, including stance, shared knowledge, levels of formality; and Organizing and articulating ideas in an academically suitable format including appropriate vocabulary an rammar; and Critically examine their own language proficiency and analyze how that relates to their ability to perforr uccessfully within their discipline. Developing self-directed learning strategies.					
Course Learning							
Outcomes			rize disciplinary sources related to a spec				
	CLO 2 pr	CLO 2 produce texts (written and spoken) appropriate for a cross-disciplinary audience based on their chowledge					
	CLO 3 ide	entify their own lar	nguage learning needs and implement a	plan to meet those needs			
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL	NIL					
Offer in 2020 - 2021	Y 1st	sem 2nd sem	Offer in 2021 - 2022 : Y	Examination	No Exam		
Grade Descriptors (A+ to F)	A	using original langua	nsistently demonstrates ability to summarize salier age. Text uses sources appropriately and demons acteristics. Language learning needs are clearly id	strates accurate and appropriate g	rammatical, lexical and		
	B Good to very good result. Usually demonstrates ability to summarize salient points accurately using mostly original language. Text mostly uses sources appropriately and demonstrates mostly accurate and appropriate grammatical, lexical and organizational characteristics. Language learning needs are stated with some reference to evidence of planning and reflection although there is some misalignment between goals and self-study completed.						
	C Satisfactory to reasonably good result. Demonstrates some ability to summarize salient points using mostly original language although some inaccuracies are present. Text uses some sources appropriately and demonstrates appropriate but simple grammatical and lexical characteristics with some organizational flaws. Language learning needs are stated with some limited evidence of planning and reflection but goals and self-study are misaligned.						
	D Barely satisfactory result. Demonstrates a limited ability to summarize salient points from sources with inaccuracies and little original language. Text uses sources inappropriately and demonstrates grammatical inaccuracy, inappropriate lexical choices and organizational flaws. There is a minimal statement of language learning needs, planning and reflection with little or no apparent alignment between goals and self-study. Fail Unsatisfactory result. Does not demonstrate ability to summarize salient points identify, interpret or appropriately paraphrase reliable sources. Text uses no sources and demonstrates serious grammatical, lexical and/or organizational errors. Does not						
		demonstrate any me	eaningful attempt to identify language learning need				
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	5	Details		No. of Hours		
& Learning Activities	Tutorials		seminars		36		
& Learning Activities	Reading / Self study				120		
	Assessment				84		
		ent	independent learning work		04		
			independent learning work Details	Weighting in final course grade (%)	Assessment Methods		
	Assessme				Assessment		
	Assessme Methods		Details	course grade (%)	Assessment Methods		
	Assessme Methods Assignme		Details independent learning work	course grade (%)	Assessment Methods		
Assessment Methods and Weighting Required/recommended reading and online materials	Assessme Methods Assignme Essay Test	ents	Details independent learning work	course grade (%) 20 55 25	Assessment Methods		
and Weighting Required/recommended reading and	Assessme Methods Assignme Essay Test Course ma	ents	independent learning work other genres of writing ided electronically through course websited	course grade (%) 20 55 25	Assessment Methods		
and Weighting Required/recommended reading and online materials	Assignment Essay Test Course manufacture Mattheward Course manufacture Mattheward Course Mattheward Co	ents aterials to be prov s.hku.hk/caes9820	independent learning work other genres of writing ided electronically through course websited	course grade (%) 20 55 25 te.	Assessment Methods to CLO Mappin		

CAES9821		ional and technical o s (6 credits)	communication for mathematic	al Academic Year	2020	
Offering Department	English	,		Quota		
Course Co-ordinator	Mr S D B	oynton, English (sboyntor	n @hku.hk)			
eachers Involved		Boynton, Centre for Applie				
Course Objectives		edit English-in-the-Discipl disciplinary studies in mat	line course aims to develop students' thematical sciences.	professional and technic	al communicatio	
Course Contents & Topics	1. Case s 2. Profess Students		n the course: for presenting and explaining mather indations convincingly in both written			
	achieved	through analysing sample	es of case study reports and presental	tions using a genre-base	d approach.	
Course Learning	On succe	ssful completion of this co	ourse, students should be able to:			
Outcomes	CLO 1 p	resent and explain mathe	matical and statistical data and trends	using appropriate rhetor	ical skills	
		rganize and articulate co ral presentation	herent ideas with appropriate langua	ge devices in a case stu	idy report and a	
	CLO 3 ju	stify analyses and recom	mendations convincingly in a case stu	dy report and an oral pre	sentation	
	CLO 4 id	lentify their own languag	ge learning needs, develop independ own independent language learning e	ent learning strategies		
Pre-requisites and Co-requisites and Impermissible combinations)	NIL			<u> </u>		
Offer in 2020 - 2021	Y 1st	sem 2nd sem Offer i	n 2021 - 2022 : Y	Examination	No Exam	
Grade Descriptors (A+ to F)	A	work. Students are able to data limitations when relevant specific and relevant future	ve skills displaying a complete awareness of au critically analyse a case scenario, convincingly nt. Students are able to successfully evaluate t language learning plans. Spoken language is ge of grammar and vocabulary, with very few sy	justify analyses and recomme heir language performance in fully comprehensible and flu	ndations, and discu all areas and propo	
	В	Mostly appropriate productive skills displaying good awareness of audience, purpose and structure, although there are occasional lapses in areas. Students are able to analyse a case scenario, justify analyses and recommendations, and discuss data limitations when relevant. Students are able to evaluate their language performance in most areas and propose relevant future language learning plans. Spoken language is comprehensible and fluent. Written language contains a good range of grammar and vocabulary, making some systematic errors of language which generally do not impede understanding. Productive skills are generally appropriate for the intended audience. There is an overall sense that the work is communicating				
	С	successfully. Purposes are g and make recommendations language performance in a	lly appropriate for the intended audience. There jenerally clear and tone is generally suitable. St i, but the analysis and recommendations need i limited number of areas and proposed future prehensible and fluent. Written language co	udents are generally able to ar more justification. Students are language learning plans are	alyse a case scena able to evaluate the rather vague. Spoke	
	D	Productive skills display wea analyse a case scenario, ar links between sections may proposed future language le and vocabulary, but the wi	aknesses in awareness of purpose and audience of the analyses and recommendations are vagous be lacking. Students are able to evaluate the aarning plans may not be relevant. Written languistiten work can still be followed by a patien lent, but stain is at times placed on the listener.	gue. The structure is generally ir language performance only guage contains frequent errors	appropriate althou in few areas and t in complex gramm	
	Fail	are unable to analyse a case Students are not able to eva- language errors in both sim	or no awareness of audience or are too limited e scenario and make reasonable recommenda aluate their language performance and propose ple and complex grammar in written work, wh aces considerable strain on the listener through	tions. Ideas are incoherent, va e future language learning plar ich impede successful compre	gue and unstructure is. There are freque hension of ideas a	
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	s	Details		No. of Hours	
Learning Activities	Lectures		seminars		30	
	Tutorials		small group tutorials		6	
	Reading	/ Self study			120	
	Assessm	ent	independent learning work		84	
ssessment Methods nd Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mappir	
	Assignm	ents		40	- J. P.	
	Presenta			30		
	Project re			30		
Additional Course nformation	Students intend to	tudents of the BSc (Actuarial Science) and BASc(Applied AI) are required to take this cutend to major in decision analytics, mathematics, risk management, and statistics are strong is course. Students from other science disciplines should take CAES9820.				

CHEM1041	Founda	tions of chemisti	ry (6 credits)	Academic Yea	r 2020				
Offering Department	Chemistry			Quota	50				
Course Co-ordinator	Dr A P L	Tong, Chemistry <i>(ap</i> .	ltong@hku.hk)						
Teachers Involved		Dr A P L Tong,Chemistry)							
Course Objectives	interested			SE Chemistry or an equivalent be ding of the essential fundamen					
Course Contents & Topics			rties and Behaviour (6 hours) G etic-molecular theory of gases.	sas pressure; the gas laws; the	ideal gas law an				
	chemical molecular	change; electronega shape. Intermolecular Force	ativity and bond polarity; Lewis st s: Liquids, Solids, and Phase Ch	lent, ionic and metallic bonds; ructures of molecules and ions; v anges (8 hours) Physical states and id state: structure, properties, and	SEPR Theory and				
	calculatio	n of equilibrium cons	stants and reaction quotient; Le C	·	·				
0	nomencla	ture; stereoisomeris	m in organic compounds.	view of organic compounds and	structures; organ				
Course Learning Outcomes			his course, students should be ab	มe to: n to some chemical vocabulary,	terminology on				
Cutcomes		emonstrate knowled onventions	ge and understanding in relatio	ii to some chemical vocabulary,	terminology and				
	CLO 2 de	emonstrate knowled le nature of gases, p	hase changes, chemical bonding	al stoichiometry, the properties of and structures, and the nature of	chemical equilibr				
	CLO 3 demonstrate a basic knowledge of organic compounds and structures, nomenclature, and isomerism in organic compounds								
	CLO 4 apply the theories and concepts introduced in the course to solve problems, perform calculations, make predictions and rationalize trends CLO 5 organize and present chemical ideas in a clear, logical and coherent way								
	CLO 6 demonstrate awareness and appreciation of the relevant applications of chemistry in society and in everyday life								
Pre-requisites and Co-requisites and Impermissible combinations)	Students coordinate	without such backgr or for consideration.	ound but keen on taking this fou	component or Integrated Science ndation chemistry course may ap having taken any level 1 Chemist	proach the cours				
		uivalent Chemistry c							
Offer in 2020 - 2021		sem Offer in 2021		Examination	Dec				
Grade Descriptors (A+ to F)	A	learning outcomes. Sh	ow thorough grasp of the subject. Demon owledge to a wide range of complex, famil	sive knowledge and skills required for a strate strong analytical and critical abiliti iar and unfamiliar situations. Apply highly	es and logical thinkin				
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show substantial grasp of the subject. Demonstrate evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.								
	С	outcomes. Show general but incomplete grasp of the subject. Demonstrate evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.							
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show partial but limited grasp, with retention of some relevant information, of the subject. Demonstrate evidence of some coherent and logical thinking, but with limited analytical and citical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.								
	Fail	evidence of little or no	grasp of the knowledge and understand Show very little or no ability to apply kno	I skills required for attaining the course leading of the subject. Lack of analytical and wledge to solve problems. Organization a	critical abilities, logic				
Course Type		ased course							
Course Teaching	Activitie	S	Details		No. of Hours				
Learning Activities	Lectures				36				
	Tutorials	/ Calf atual:			12				
Annual Made de		/ Self study	D. 4. 11	W	100				
Assessment Methods and Weighting	Methods	i	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mappin				
	Assignme			30	CLO 1,2,3,4,5				
	Examina	tion		55	CLO 1,2,3,4,5,6				
	Test			15	CLO 1,2,3,4,5,6				
Required/recommended		Herring; Madura; B	issonnette: General Chemistry:	Principles and Modern Application	ons, latest edition				
eading and	Pearson.	7 1110 7							
online materials Additional Course		lahl; Zumdahl: Chemistry, latest edition, Cengage. ested follow-up course: CHEM1042 General Chemistry I							

CHEM1042	General chemistry I (6 credits)	Academic Year	2020
Offering Department	Chemistry	Quota	450
Course Co-ordinator	Dr A P L Tong, Chemistry (apltong@hku.hk)		
Teachers Involved	(Dr A P L Tong, Chemistry)		
Course Objectives	The course aims to provide students with a solid foundation of the basic princ also provides students with hands-on training of basic laboratory skills and		

Laborator Tutorials Reading / Methods Examinati Laborator Test Petrucci; I Pearson. Zumdahl; Stolzfus: C	ion y reports Herring; Madura; Bisso Decoste: Chemical Pri	Details Onnette: General Chemistry: Principles, latest edition, Cengage. E Science, latest edition, Pearson. Ty. Students must complete ALL ex	Brown; LeMay; Bursten; I	Murphy; Woodward		
Laborator Tutorials Reading / Methods Examinati Laborator Test Petrucci; I	Self study ion y reports		course grade (%) 60 25 15	24 6 100 Assessment Methods to CLO Mapping CLO 1,2,3,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,5,6		
Laborator Tutorials Reading / Methods Examinati Laborator	Self study	Details	60 25	24 6 100 Assessment Methods to CLO Mapping CLO 1,2,3,5,6 CLO 1,2,3,4,5,6		
Laborator Tutorials Reading / Methods Examinati	Self study	Details	course grade (%)	24 6 100 Assessment Methods to CLO Mapping CLO 1,2,3,5,6		
Laborator Tutorials Reading / Methods	Self study	Details	course grade (%)	24 6 100 Assessment Methods to CLO Mapping		
Laborator Tutorials Reading /	Self study	Details		24 6 100 Assessment		
Laborator Tutorials	•			24 6		
Laborator	у			24		
	v					
Lectures				24		
		Details				
				No. of Hours		
= =+····	ineffective lab skills and tec	chniques. Organization and presentational sk	ills are minimally effective or inef	fective.		
Fail	Demonstrate little or no evidence of little or no gras	sp of the knowledge and understanding of t	he subject. Lack of analytical ar	id critical abilities, logic		
D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show partial but limited grasp, with retention of some relevant information, of the subject. Demonstrate evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Demonstrate partially effective lab skills and techniques. Apply limited or barely effective organizational and						
Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show general but incomplete grasp of the subject. Demonstrate evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Show moderately effective lab skills and techniques. Apply moderately effective organizational and presentational skills.						
B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show substantial grasp of the subject. Demonstrate evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Show effective lab skills and techniques. Apply effective organizational and presentational skills.						
Α	Demonstrate thorough mas learning outcomes. Show the with ability to apply knowled	stery at an advanced level of extensive kn horough grasp of the subject. Demonstrate dge to a wide range of complex, familiar and	owledge and skills required for strong analytical and critical abil unfamiliar situations. Show high	attaining all the cours		
Y 1st	sem 2nd sem Offer	in 2021 - 2022 : Y	Examination	Dec May		
	-	, 2	21.2 311) 31 4501	-: -::·, oquiraloi		
				e or anv equivaler		
CLO 6 demonstrate awareness and appreciation of the relevant applications of chemistry in society and in everyday life						
an	id interpret and evaluate	e the experimental data		rvations accurately		
pre	edictions and rationalize	e trends				
CLO 2 de	monstrate knowledge a	and understanding in relation to the		of reactions as we		
CLO 1 de	emonstrate a basic kno	owledge and understanding of the	•	omic structure and		
properties	and acid strength; acid	l-base properties of salt solutions; b				
that influer mechanisr 5. Acid-Ba	nce reaction rate; rate l ms. ise equilibria	laws: differential and integrated rate	laws; temperature and re	eaction rate; reaction		
Energet	tics and kinetics of reac	tions				
quantum r orbitals; el 3. Chemic	mechanical model of th lectron configurations; pall al bonding and structure	ne atom; quantum numbers, energy periodic trends: atomic radii, ionic ra es	levels, and atomic orbita dii, ionization energies, an	ls; shapes of atom d electron affinities		
length, vol solutions a	lume and temperature; and concentrations; unc	atomic structure and subatomic p	articles; the mole concep			
1. Chemistry: its nature and method Physical properties: chemical changes and chemical properties: elements and compounds: measuring mass						
		ped with a good foundation of thee	retical and practical know	vicage and skills it		
Infile S2E 0 03F4 Ftl n S4 pC (((() () L N C Y) I I I I I I I I	methods. urther stul. Chemis Physical pength, vo solutions a 2. Atoms: Electroma quantum r profitals; els 3. Chemic Review or 1. Energe Heat and hat influe hat influe co CLO 2 de as CLO 3 ap CLO 4 ca ar CLO 5 or CLO 6 de ev evel 3 or Not for str Chemistry (1 st A B C Lecture wi Activities	methods. Students will be equipurther studies in Chemistry. I. Chemistry: its nature and methorysical properties; chemical clength, volume and temperature; solutions and concentrations; und and temperature; solutions and concentrations; und and concentrations; und and and concentrations; und and and concentrations; und and and and and and and and and and a	methods. Students will be equipped with a good foundation of theourther studies in Chemistry. I. Chemistry: its nature and method Physical properties; chemical changes and chemical properties; clength, volume and temperature; atomic structure and subatomic psolutions and concentrations; uncertainty in measurement and signification and matter; Planck's quantum theory; quantum mechanical model of the atom; quantum numbers, energy probitals; electron configurations; periodic trends: atomic radii, ionic radii consuments, electron configurations; periodic trends: atomic radii, ionic radii consuments, electron configurations; periodic trends: atomic radii, ionic radii consuments, electron covalent, ionic and metallic bond. Covalent bonds and model. Energetics and kinetics of reactions Review on covalent, ionic and metallic bond. Covalent bonds and model. Energetics and kinetics of reactions Reat and work; the first law of thermodynamics; heat of reactions; sheat influence reaction rate; rate laws: differential and integrated rate nechanisms. 5. Acid-Base equilibria 6. Acid-Base equilibria in solutions of weak acids and in corporaties and acid strength; acid-base properties of salt solutions; by conservation and acid strength; acid-base properties of salt solutions; by concepts of chemical bonding and their relationships with the concepts of chemical bonding and their relationships with the concepts of chemical bonding and their relationships with the concepts of chemical experiments with proper procedures, recand interpret and evaluate the experimental data CLO 3 apply the theories and concepts introduced in the course to predictions and rationalize trends CLO 4 carry out chemical experiments with proper procedures, readii interpret and evaluate the experimental data CLO 5 organize and present chemical ideas in a clear, logical and occordinates awareness and appreciation of the relevant everyday life everl 3 or above in HKDSE Chemistry or equivalent or a pass in CHB Not for students having taken any level 1	Chemistry: its nature and method Physical properties; chemical changes and chemical properties; elements and compounds ength, volume and temperature; atomic structure and subatomic particles; the mole conceptioutions and concentrations; uncertainty in measurement and significant figures. Atoms: the quantum world Electromagnetic radiation and matter, Planck's quantum theory, the Bohr model of the Army quantum numbers, energy levels, and atomic orbital problems, and atomic or		

CHEM1043	General chemistry II (6 credits)	Academic Year	2020
Offering Department	Chemistry	Quota	280
Course Co-ordinator	Dr A P L Tong, Chemistry (apltong@hku.hk)		
Teachers Involved	(Dr A P L Tong,Chemistry) (Prof D L Phillips,Chemistry)		
Course Objectives	This course is a continuation of CHEM1042 General Chemistry I. It aims to important fundamentals of chemistry that underlie many topics and principles a		

Assessment Methods	Methods			vveidhting in tinal	Assessment	
	Reading	/ Self study	Details	Weighting in final	Assessment	
•	Tutorials	/ Salf study			12 100	
Leaning Activities	Lectures				36 12	
& Learning Activities		5	Details			
Course Type Course Teaching	Activitie:		Details		No. of Hours	
Course Type	Lecture-b	are minimally effective		owiedge to solve problems. Organization	i and presentational skil	
	Fail	Demonstrate little or revidence of little or n	ed of barely effective organizational and pro- no evidence of command of knowledge an o grasp of the knowledge and understand , Show very little or no ability to apply kno	d skills required for attaining the course ding of the subject. Lack of analytical ar	nd critical abilities, logica	
	D	Show partial but limi coherent and logical	out limited command of knowledge and sk ted grasp, with retention of some releva thinking, but with limited analytical and o ed or barely effective organizational and pr	ant information, of the subject. Demonstritical abilities. Show limited ability to a	strate evidence of som	
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show general but incomplete grasp of the subject. Demonstrate evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes.				
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the cours learning outcomes. Show substantial grasp of the subject. Demonstrate evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
Grade Descriptors (A+ to F)	A	learning outcomes. S with ability to apply kr and presentational sk		onstrate strong analytical and critical abi iliar and unfamiliar situations. Apply high	lities and logical thinkin ly effective organization	
Offer in 2020 - 2021			Offer in 2021 - 2022 : Y	Examination	,	
and Co-requisites and Impermissible combinations)	Not for stu	udents in 2014-15 o	cohort or before having taken CHE			
Pre-requisites		emonstrate awaren HEM1042; and	ess or the relevant applications of	chemistry in society and in ever	yuay iiie	
	CLO 6 organize and present chemical ideas in a clear, logical and coherent way CLO 7 demonstrate awareness of the relevant applications of chemistry in society and in everyday life					
	CLO 5 apply the theories and concepts introduced in the course to solve problems, perform calculations, make predictions and rationalize trends					
	re	CLO 4 demonstrate a knowledge and understanding of the relationship between free energy and spontaneity of reaction				
	se	econd period of eler	tal theory to explain the formatio ments and of some simple polyato	omic molecules		
	cc	omplex-ion equilibri	ledge and understanding in relata a, and also electrochemistry		•	
Outcomes	CLO 1 demonstrate a knowledge and understanding of the properties and behavior of gases an and kinetic-molecular theory to processes involving gases					
Course Learning	On succe	ssful completion of	patteries; corrosion; electrolysis; in this course, students should be a	ble to:		
	6. Electro Electrode	chemistry potentials and the	eir measurement; standard elect		and K; Ecell as	
	A quick re		nd the second & third laws of ther im; coupled reactions.	modynamics. Standard Gibbs e	nergy change; Gibl	
	limitations analysis.	of the Ksp concep	pt; precipitation; solubility and pH			
	nonelectro 4. Solubili	olyte solutions; solu ity and Complex-Ior	itions of electrolytes; colloidal mix	tures.		
	3. Solution Types of	ns and their Proper solutions; intermole		ess; solution formation and equi		
	Bonding i	n homonuclear and	e Delocalized Approach: Molecula I heteronuclear diatomic molecula ecules; bonding in metals (band th	es of first and second period of e	elements; bonding	
& Topics	gases; dif	fusion and effusion	; non-ideal gases.	-	-molecular trieory	
•	1. Gases Simple gas laws; ideal gas equation; gases in chemical reactions; mixture of gases; kinetic-molecular theory of gases; diffusion and effusion; non-ideal gases.					

CHEM1044	Mathematics in chemistry (6 credits)	Academic Year	2020
Offering Department	Chemistry	Quota	80
Course Co-ordinator	Dr A M Y Yuen, Chemistry (maiyan@hku.hk)		
Teachers Involved	(Dr A M Y Yuen, Chemistry)		
	(Dr J Yang,Chemistry) (Dr. J Z Liu,Chemistry)		
Course Objectives	1, ,	mietry This sour	ao aima ta aguin
Course Objectives	Mathematical calculations are necessary to explore important concepts in che students with a basic knowledge of some of the mathematics that will be used in		

	major curriculum to enable them to apply the mathematical skills to problems in chemistry. Students taking this course are expected to already have achieved level 2 or above in Module 1 or Module 2 of HKDSE Mathematics or equivalent, or a pass in MATH1011 University Mathematics I. As far as possible, the mathematical concepts covered in this course will be put in the context of chemical problems. Applying mathematical tools, such as Algebra, Trigonometry, Calculus, Complex number, Vector, Matrix, Linear					
Course Contents & Topics			ch as Algebra, Trigonome solving chemistry probler		lex number, Ve	ector, Matrix, Linear
Course Learning Outcomes	CLO 1 c CLO 2 a CLO 3 l	On successful completion of this course, students should be able to: CLO 1 demonstrate knowledge and understanding of the essential mathematics used in chemistry CLO 2 apply mathematical skills to solve basic problems in chemistry CLO 3 be more capable of coping with a higher level of mathematics required in relevant courses for chemistry major, in particular, in physical chemistry courses				
Pre-requisites (and Co-requisites and Impermissible combinations)	Level 2	Pass in CHEM1042 or already enrolled in this course; and Level 2 or above in Module 1 or Module 2 of HKDSE Mathematics or equivalent, or Pass in MATH1011 or SCNC1111				
Offer in 2020 - 2021	Y 2r	nd sem Offer in 2021 -	2022 : Y		Examination	May
Grade Descriptors (A+ to F)	A	applications through corre	understanding of key concepts a ctly analysing problems, clearly t computations carefully and corr	and elegantly presenting of	correct logical reaso	oning and argumentation
	В	Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.				
	С	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.				
	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.				
	Fail Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.					
Course Type	Lecture-	based course				
Course Teaching	Activitie	es	Details			No. of Hours
& Learning Activities	Lectures	=				36 12
	Tutorials	-				
		g / Self study				100
Assessment Methods and Weighting	Method	s	Details		nting in final se grade (%)	Assessment Methods to CLO Mapping
	Assignn	nents			20	CLO 1,2,3
	Examina	ation			60	CLO 1,2,3
	Test				20	CLO 1,2,3
Required/recommended reading and online materials			: Maths for Chemists, 2nd ths Book, 2nd Edition, Oxf			

CHEM2041	Principles of chemistry (6 credits)	Academic Year	2020				
Offering Department	Chemistry	Quota	140				
Course Co-ordinator	Dr I K Chu, Chemistry (ivankchu@hku.hk)						
Teachers Involved							
Course Objectives	This course is designed for non-chemistry major students covering basic pri	inciples of chemistry.					
Course Contents & Topics	Gas Laws and the Kinetic Theory of Gases Thermodynamics: work, heat, the zeroth and first law of thermodynamics, internal energy, enthalpy, heat capacities, thermochemistry, Hess's Law, Kirchhoff's Law, the second and third laws of thermodynamics, entropy Gibbs free energy, spontaneity, equilibrium, coupled reaction; Transport Phenomena: diffusion, viscosity of gases, diffusion in liquids and viscosity of liquids, ionic conduction; Chemical Kinetics: rate of reactions, orders of reactions, rate laws, reaction mechanism, experimental measurement of reaction rates, enzyme kinetics, enzyme inhibition, temperature effect on rates; Chemical Equilibrium; Equilibria in single-, and two component systems: phase transitions, phase diagrams and the phase rule, chemical potential; liquid/liquid systems; Introduction to acids and bases: calculation on concentration of different chemical species in a solution, diprotic and polyprotic acids, activity; Introduction to Spectroscopy: UV/Visible absorption spectroscopy, Beer-Lambert Law; IR Spectroscopy, identification of functional groups; NMR Spectroscopy, Larmor frequency & chemical shift, peak integral, spin-spir						
Course Learning Outcomes	On successful completion of this course, students should be able to:	CLO 1 explain the principles of the thermochemistry, chemical kinetics, chemical equilibrium, physical properties of solutions and gases					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in CHEM1042; and Not for students who have passed in CHEM2341, or have already enrolled in this course; and Not for students who have passed in CHEM2441, or have already enrolled in this course; and Not for students who have passed in CHEM2541, or have already enrolled in this course; and Not for Chemistry major students.						
Offer in 2020 - 2021	N Offer in 2021 - 2022 : N	Examination					
Grade Descriptors (A+ to F)	Demonstrate thorough knowledge and understanding of essential facts, concep chemistry, instrumentations and applications of spectrometry and spectroscop apply and integrate knowledge and theory, and strong ability to analyze problem Demonstrate substantial command of knowledge and understanding of essentia to the modern chemistry, instrumentations and applications of spectrometry evidence to apply and integrate knowledge and theory, and ability to analy spectroscopy. C Demonstrate general but incomplete command of knowledge and understand theories relating to the modern chemistry, instrumentations and applications	by for chemical analysis. S is related to general chemist al facts, concepts, principles and spectroscopy for chemical comparts of the problems related to generating of the problems related to generating of the problems related to generating of the problems related to generating of the problems related to generating of the problems related to generating of the problems related to generating of the problems related to generating the	how strong ability to ry and spectroscopy. and theories relating nical analysis. Show neral chemistry and cepts, principles and				

		analysis. Show evidence o situations to general chemi		ntegrate knowledge and theory, and to analyze	problems to most familiar
	D	relating to the modern che Show evidence of limited a	emistry, instrumentations and	and understanding of essential facts, concept applications of spectrometry and spectrosco & knowledge and theory, and limited ability to a roscopy.	py for chemical analysis.
	Fail	theories relating to the mo	odern chemistry, instrumenta	wledge and understanding of essential facts, tions and applications of spectrometry and si and integrate knowledge and theory, and little emistry and spectroscopy.	pectroscopy for chemical
Course Type	Lecture-ba	ased course			
Course Teaching & Learning Activities	Activities		Details	No. of Hours	
	Lectures			36	
	Tutorials				12
	Reading /	Self study			100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignme	ents		25	CLO 1,2
	Examinat	ion		75	CLO 1,2
Required/recommended reading and online materials	Spectrosc	copy for the biological so	cience, by Gordon G. Ha	ammes, Wiley-Interscience (2005)	

CHEM2241	Analytic	cal chemistry I	(6 credits)	Academic Ye	ear 2020		
Offering Department	Chemistr	У	•	Quota	120		
Course Co-ordinator	Dr E C M	Tse (1st sem); Dr	I K Chu (2nd sem), Chemistry (ecmtse@hku.hk; ivankchu@hku.hk	:)		
Teachers Involved	,	// Tse,Chemistry) nu,Chemistry)	, , ,		,		
Course Objectives	The course aims to introduce the basic principles of chemical analysis. The principles of chemical measurement, including error analysis, quality assurance and calibration, data acquisition and processing, will be discussed with reference to methods of chemical analysis that are based on chemical equilibrium and stoichiometric reactions. The laboratory classes will include experiments demonstrating modern approaches of data acquisition and processing as well as chemical analysis based on chemical equilibrium.						
Course Contents & Topics	Measurer	ment: analog and		cy and precision, comparing mea	ns and deviations		
			n of analytical procedures chemical analysis: aqueous sol	lution and chemical equilibrium; ar	nalysis by acid-bas		
	reactivity,	, complexation rea	ctivity, precipitation reactivity	•	•		
Course Learning			f this course, students should be	e able to:			
Outcomes	CLO 1	explain the basic p	rinciples of chemical measurem	ents			
	CLO 2	CLO 2 explain the principles of classical methods of chemical analysis such as acid-base neutralization					
	CLO 3	CLO 3 use laboratory apparatus for chemical analysis					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in C	Pass in CHEM1042 (for students admitted in 2014-15 or before); Pass in CHEM1042; and Pass in CHEM1043, or already enrolled in this course (for students admitted in 2015-16 or thereafter)					
Offer in 2020 - 2021	Y 1st	sem 2nd sem	Offer in 2021 - 2022 : Y	Examination	Dec May		
Grade Descriptors	Α			e of strong analytical abilities, logical and in			
(A+ to F)	and techniques and critical use of data and results to draw appropriate and insightful conclusions. Demonstrate highly effective organization and presentation skills. B Demonstrate substantial grasp of the subject. Show evidence of analytical abilities and logical thinking, some evidence of independent thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate proficient lab skills and techniques and correct use of data and results to draw appropriate conclusions. Demonstrate effective organization and presentation skills.						
	C Demonstrate general but incomplete grasp of the subject. Show evidence of some analytical abilities and logical thinking, little evidence of independent thinking, and ability to apply knowledge to most familiar situations. Demonstrate adequate lab skills and techniques and mostly correct but some erroneous use of data and results to draw appropriate conclusions. Demonstrate moderately effective organization and presentation skills.						
	D	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Show evidence of limited analytical abilities, little or no evidence of independent thinking, and limited ability to apply knowledge to solve problems. Demonstrate partially effective lab skills and techniques and limited ability to use data and results to draw appropriate conclusions. Demonstrate limited or barely effective organization and presentation skills.					
	Fail	abilities, logical and minimally effective	d independent thinking, and very little	derstanding of the subject. Show little or no ron ability to apply knowledge to solve and misuse of data and results and/or unpresentation skills.	problems. Demonstrat		
Course Type	Lecture w	vith laboratory com	ponent course				
Course Teaching	Activitie	s	Details		No. of Hours		
& Learning Activities	Lectures				24		
	Laborato	ry			24 6		
	Tutorials						
	Reading	/ Self study			100		
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mappin		
	Assignm	ents		10	CLO 1,2		
	Examina	tion		50	CLO 1,2		
	Laborato	ry reports		20	CLO 3		
	Test			20	CLO 1,2		
Required/recommended			ouch, "Fundamentals of Analytic				

online materials	
Additional Course	Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports to pass this
Information	course.

CHEM2341	Inorgar	nic chemistry I (6 cre	edits)	Academic Ye	ear 2020		
Offering Department	Chemistr		•	Quota	120		
Course Co-ordinator	Prof V W	/ W Yam (1st sem); Dr H	Y Au Yeung (2nd sem), Chemist	ry (wwyam@hku.hk; hoyuay	@hku.hk)		
Teachers Involved	(Prof H Z	Y Yuen,Chemistry) Z Sun,Chemistry) V W Yam / Dr H Y Au Ye	ung Chomistry)				
Course Objectives			ung,Cnemistry) c principles and knowledge of ino	rganic chemistry and to intro	duce their relevanc		
Jourse Objectives	to biolog	ical processes and mate y.	rials science. This course provid	es the foundation for further	studies in inorgani		
Course Contents & Topics	absorption substituti	Acid-base concept; structure and bonding of transition metal complexes and main group compounds; electronical bosorption and magnetic properties of metal complexes; chemical reactions of metal complexes: redox and substitution; chemistry of selected main group elements and transition metal complexes and their relevance to biology and materials. On successful completion of this course, students should be able to:					
Course Learning	On succe	essful completion of this	course, students should be able t	o:			
Outcomes	S	selected examples of biol	nciples and concepts of inorgan ogical processes and materials s	cience	e their relevance to		
	CLO 2 demonstrate knowledge and understanding of the acid-base concept and definition CLO 3 demonstrate knowledge and understanding of the structure and bonding of main group compounds and transition metal complexes and their relevance to the electronic absorption and magnetic properties of transition metal complexes						
	CLO 5 d	he thermodynamic and ki demonstrate knowledge	and understanding of the thermoon inetic aspects of substitution and and understanding of the role	redox reactions	•		
		complexes in bioinorganic		ULEN40044	11.01.		
Pre-requisites and Co-requisites		ass in CHEM1042; and NOT for students who have passed in CHEM2041, or already enrolled in this course (
and Impermissible		admitted in 2014-15 or b CHEM1042: and Pass in	CHEM1043, or already enrolled	I in this course: and NOT fo	r students who hav		
combinations)			enrolled in this course (for stude				
Offer in 2020 - 2021		st sem 2nd sem Offer	in 2021 - 2022 : Y	Examination	Dec May		
Grade Descriptors	Α		wledge and understanding of essential fa organic chemistry, especially those relate				
(A+ to F)	В	aspects of metal complexes ability to apply and integra strong ability to analyze no conclusions relating to the skills and techniques, espec Demonstrate substantial co	plexes; electronic absorption spectroscop s and their reactions; and their relevance te knowledge and theory relating to the ovel problems and critical use of data a basic principles and knowledge of inorga cially in the synthesis and characterization mmand of knowledge and understanding wledge of inorganic chemistry, especially	to biological processes and materi basic foundation knowledge of in and experimental results to draw a unic chemistry. Demonstrate highly n of inorganic compounds and mete of essential facts, concepts, princip	als science. Show stron organic chemistry. Show oppropriate and insightful effective basic laborator all complexes. oles, and theories relating		
		main group compounds thermodynamic and kinetic materials science. Show ev- inorganic chemistry. Show appropriate conclusions re- laboratory skills and technic	and metal complexes; electronic abs aspects of metal complexes and their vidence to apply and integrate knowledg evidence to analyze novel problems a lating to the basic principles and know ques, especially in the synthesis and char	corption spectroscopy, magnetic reactions; and their relevance to lee and theory relating to the basic and correct use of data and expeledge of inorganic chemistry. Den acterization of inorganic compound	properties as well as piological processes an foundation knowledge or imental results to draw nonstrate effective basis and metal complexes.		
	С	theories relating to the ba structure and bonding of m as well as thermodynamic processes and materials so basic foundation knowledge correct but erroneous use knowledge of inorganic ch	ncomplete command of knowledge and sic foundation knowledge of inorganic ain group compounds and metal comples and kinetic aspects of metal comples icince. Show evidence of some abilities e of inorganic chemistry. Show ability to of data and experimental results to draw emistry. Demonstrate moderately effecti- tion of inorganic compounds and metal co	chemistry, especially those relate kes; electronic absorption spectrosc kes and their reactions; and their to apply and integrate knowledge a o analyze problems to most famili appropriate conclusions relating to we basic laboratory skills and tech	d to acid-base concept copy, magnetic propertie relevance to biologica and theory relating to the ar situations and mostle the basic principles an		
	D	relating to the basic founda bonding of main group cor thermodynamic and kinetic materials science. Show ev knowledge of inorganic che erroneous use of data and inorganic chemistry. Demo	ited command of knowledge and unders tition knowledge of inorganic chemistry, pounds and metal complexes; electron aspects of metal complexes and their idence of limited abilities to apply and int emistry. Show limited ability to analyze experimental results to draw appropriate partially effective basic laborate compounds and metal complexes.	especially those related to acid-basic absorption spectroscopy, magne reactions; and their relevance to legrate knowledge and theory relating problems to most familiar situation conclusions relating to the basic pri	se concept; structure an etic properties as well a biological processes an ing to the basic foundation is and mostly correct by noiples and knowledge		
characterization of inorganic compounds and metal complexes. Demonstrate little or no evidence of command of knowledge and understanding of essential theories relating to the basic foundation knowledge of inorganic chemistry, especially those structure and bonding of main group compounds and metal complexes; electronic absorption sp as well as thermodynamic and kinetic aspects of metal complexes and their reactions; an processes and materials science. Show little or no evidence of abilities to apply and integrate k the basic foundation knowledge of inorganic chemistry. Show little or no ability to analyze prot and erroneous use of data and experimental results to draw appropriate conclusions relating knowledge of inorganic chemistry. Demonstrate minimally effective basic laboratory skills an synthesis and characterization of inorganic compounds and metal complexes.				chemistry, especially those relate kes; electronic absorption spectrosc kes and their reactions; and their ties to apply and integrate knowled or no ability to analyze problems to propriate conclusions relating to the basic laboratory skills and tech-	d to acid-base concept copy, magnetic propertie relevance to biologica lge and theory relating to most familiar situation the basic principles and		
Course Type	Lecture v	with laboratory componer	• •	·			
Course Teaching	Activitie	•	Details		No. of Hours		
Learning Activities	Lectures						
Learning Activities	Laborato				24		
3	Tutorials		24				
• • •					24 6		
	Reading	ر / Self study		W. 12	24 6 100		
Assessment Methods		ر / Self study	Details	Weighting in final course grade (%)	24 6 100 Assessment Methods		
Assessment Methods and Weighting	Reading Method: Assignm	g / Self study s nents	Details	course grade (%)	24 6 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5		
Assessment Methods	Reading Methods	g / Self study s nents	Details	course grade (%)	24 6 100 Assessment Methods to CLO Mapping		

	Test		22	CLO 1,2,3,4,5
Required/recommended	F. A. Cotton; G. Wilkinson; P. L. O	Gaus : Basic Inorganic Chemistr	(John Wiley & Sons, 199	5, 3rd ed.)
reading and	P. Atkins, T. Overton, J. Rourke	M. Weller and F. Armstrong:	Shriver & Atkins Inorgan	ic Chemistry (Oxford
online materials	University Press, 2006, 4th ed.)			
Additional Course	Laboratory classes are mandatory	. Students must complete ALL	experiments and laborator	ry reports to pass this
Information	course.			

		c chemistry I (6 cre	dits)	Academic Yea		
Offering Department	Chemistr	•		Quota	200	
Course Co-ordinator		· /·	(2nd sem), Chemistry (xiaoyuli@hku.i	hk; pchiu@hku.hk)		
Teachers Involved	(Dr Z X H	_i,Chemistry) Huang,Chemistry) Chiu,Chemistry)				
Course Objectives	To provid	de students with the ba	sic principles to understand the struct organic chemistry in daily life and indu		nic molecules, wit	
		rse serves as the first p //3441 Organic Chemist	part of the complete program on funda ry II.	amental organic chemistry	, to be followed u	
Course Contents & Topics	stereoche compoun	emistry, chirality. Chen nds, alcohols, thiols, ar	ic compounds, three dimensional strunistry of alkanes, cycloalkanes, alkend ethers. Organometallic chemistryons of reaction mechanisms.	nes, alkynes, haloalkanes	, dienes, aromati	
Course Learning	-		course, students should be able to:			
Outcomes			pts and employ the vocabulary of orga	nic chemistry		
	CLO 2 v	visualize and draw three	e-dimensional, stereochemically correct	ct representations of organ	ic molecules	
	CLO 3 r	ecognize, discriminate	and name chiral stereoisomers and di	astereomers		
	CLO 4	understand the reactivity	y of the functional groups			
	CLO 5 L	understand reaction me	chanisms and apply mechanistic know	rledge to solve chemistry p	oroblems	
		· · · ·	nthesis of target molecules			
		• •	e of organic chemistry in biological pro	•		
Pre-requisites (and Co-requisites		CHEM1042; and NOT for admitted in 2014-15 or	or students who have passed in CHEI before):	M2041, or already enrolled	d in this course (fo	
and Impermissible			in CHEM1043, or already enrolled in	this course; and NOT for	students who hav	
combinations)	passed C	CHEM2041, or already e	enrolled in this course (for students ad	mitted in 2015-16 or there	after)	
Offer in 2020 - 2021	Y 1st	t sem 2nd sem Offe	er in 2021 - 2022 : Y	Examination	Dec May	
Grade Descriptors (A+ to F)	chemical properties, reactions and mechanisms of organic chemistry. Show a strong ability to integrate knowledge and theory and a strong ability to analyze and solve novel organic chemistry problems. Demonstrate highly effective organization, understanding, and execution of lab skills and techniques in organic chemistry experiments. B Demonstrate substantial command of knowledge and understanding of essential facts and concepts pertaining to the chemical properties, reactions and mechanisms of organic chemistry. Show evidence of ability to integrate knowledge and theory, and evidence of ability to analyze and solve novel organic chemistry problems. Demonstrate effective organization, understanding and execution of lab skills and techniques in organic chemistry experiments. C Demonstrate a general but incomplete command of knowledge and understanding of essential facts and concepts pertaining to					
	the chemical properties, reactions and mechanisms of organic chemistry. Show evidence of some ability to integrate knowledge and theory, and evidence of some ability to analyze novel problems. Show a mostly correct use of knowledge to solve most familiar problems. Demonstrate adequately effective organization, understanding, and execution of lab skills and techniques in organic chemistry experiments.					
	_		Demonstrate a partial but limited command of knowledge and understanding of essential facts and concepts pertaining to the chemical properties, reactions and mechanisms of organic chemistry. Show evidence of limited ability to integrate knowledge and theory, and a limited ability to analyze novel problems. Show some correct but also erroneous use of knowledge to solve most familiar problems. Demonstrate a partially effective organization, understanding and application of lab skills and techniques in organic chemistry experiments.			
	D	chemical properties, reac and theory, and a limited most familiar problems. D	tions and mechanisms of organic chemistry. S ability to analyze novel problems. Show some emonstrate a partially effective organization, un	show evidence of limited ability correct but also erroneous use	to integrate knowledge of knowledge to solv	
	D Fail	chemical properties, reac and theory, and a limited most familiar problems. D in organic chemistry exper Demonstrate little or no ev chemical properties, react knowledge and theory, an	tions and mechanisms of organic chemistry. S ability to analyze novel problems. Show some emonstrate a partially effective organization, un	show evidence of limited ability correct but also erroneous use derstanding and application of la anding of essential facts and co low little or no evidence of ability. Show little or no evidence of ability.	to integrate knowledge of knowledge to solv ab skills and technique neepts pertaining to the to apply and integrate ty to solve most familia	
	Fail Lecture-b	chemical properties, reac and theory, and a limited most familiar problems. D in organic chemistry exper Demonstrate little or no ex chemical properties, react knowledge and theory, an problems. Demonstrate r chemistry experiments.	tions and mechanisms of organic chemistry. Sability to analyze novel problems. Show some emonstrate a partially effective organization, un riments. vidence of command of knowledge and understitions and mechanisms of organic chemistry. Shad little or no ability to analyze novel problems. Sminimal or no organization, understanding an	show evidence of limited ability correct but also erroneous use derstanding and application of la anding of essential facts and co low little or no evidence of ability. Show little or no evidence of ability.	to integrate knowledge of knowledge to solvab skills and technique ncepts pertaining to the to apply and integrat ty to solve most familia techniques in organio	
Course Teaching	Fail Lecture-b	chemical properties, reac and theory, and a limited most familiar problems. D in organic chemistry exper Demonstrate little or no ex chemical properties, react knowledge and theory, an problems. Demonstrate r chemistry experiments.	tions and mechanisms of organic chemistry. S ability to analyze novel problems. Show some emonstrate a partially effective organization, ur riments. vidence of command of knowledge and underst tions and mechanisms of organic chemistry. Sh d little or no ability to analyze novel problems. S	show evidence of limited ability correct but also erroneous use derstanding and application of la anding of essential facts and co low little or no evidence of ability. Show little or no evidence of ability.	to integrate knowledge of knowledge to solvab skills and technique neepts pertaining to the to apply and integrat ty to solve most familia techniques in organic	
Course Teaching	Fail Lecture-b Activitie Lectures	chemical properties, reac and theory, and a limited most familiar problems. D in organic chemistry exper Demonstrate little or no ex chemical properties, react knowledge and theory, an problems. Demonstrate r chemistry experiments.	tions and mechanisms of organic chemistry. Sability to analyze novel problems. Show some emonstrate a partially effective organization, un riments. vidence of command of knowledge and understitions and mechanisms of organic chemistry. Shad little or no ability to analyze novel problems. Sminimal or no organization, understanding an	show evidence of limited ability correct but also erroneous use derstanding and application of la anding of essential facts and co low little or no evidence of ability. Show little or no evidence of ability.	to integrate knowledge of knowledge to solv by skills and technique to the total pertaining to the total pertaining to the total poly and integrate to solve most familia techniques in organic No. of Hours	
Course Teaching	Fail Lecture-b Activitie Lectures Tutorials	chemical properties, reac and theory, and a limited most familiar problems. D in organic chemistry exper Demonstrate little or no ev chemical properties, react knowledge and theory, an problems. Demonstrate r chemistry experiments.	tions and mechanisms of organic chemistry. Sability to analyze novel problems. Show some emonstrate a partially effective organization, un riments. vidence of command of knowledge and understitions and mechanisms of organic chemistry. Shad little or no ability to analyze novel problems. Sminimal or no organization, understanding an	show evidence of limited ability correct but also erroneous use derstanding and application of la anding of essential facts and co low little or no evidence of ability. Show little or no evidence of ability.	to integrate knowledge of knowledge to solv by skills and technique to the to apply and integrat by to solve most familia techniques in organic No. of Hours 36 12	
Course Teaching & Learning Activities	Fail Lecture-b Activitie Lectures Tutorials Reading	chemical properties, reac and theory, and a limited most familiar problems. D in organic chemistry exper Demonstrate little or no ev chemical properties, react knowledge and theory, an problems. Demonstrate r chemistry experiments.	tions and mechanisms of organic chemistry. Sability to analyze novel problems. Show some emonstrate a partially effective organization, urriments. vidence of command of knowledge and underst tions and mechanisms of organic chemistry. Stad little or no ability to analyze novel problems. Sminimal or no organization, understanding an Details	show evidence of limited ability correct but also erroneous use derstanding and application of la anding of essential facts and corow little or no evidence of ability show little or no evidence of ability displays and application of lab skills and	to integrate knowledg of knowledge to solv ib skills and technique neepts pertaining to the to apply and integrat ty to solve most familia techniques in organi No. of Hours 36 12 100	
Course Teaching Learning Activities Assessment Methods	Fail Lecture-b Activitie Lectures Tutorials	chemical properties, reac and theory, and a limited most familiar problems. D in organic chemistry exper Demonstrate little or no ev chemical properties, react knowledge and theory, an problems. Demonstrate r chemistry experiments.	tions and mechanisms of organic chemistry. Sability to analyze novel problems. Show some emonstrate a partially effective organization, un riments. vidence of command of knowledge and understitions and mechanisms of organic chemistry. Shad little or no ability to analyze novel problems. Sminimal or no organization, understanding an	show evidence of limited ability correct but also erroneous use derstanding and application of la anding of essential facts and co low little or no evidence of ability. Show little or no evidence of ability.	to integrate knowledg of knowledge to solv ib skills and technique neepts pertaining to th to apply and integrat ty to solve most familia techniques in organi No. of Hours 36 12	
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-b Activitie Lectures Tutorials Reading	chemical properties, reac and theory, and a limited most familiar problems. D in organic chemistry exper Demonstrate little or no even chemical properties, react knowledge and theory, an problems. Demonstrate re chemistry experiments. Dased course	tions and mechanisms of organic chemistry. Sability to analyze novel problems. Show some emonstrate a partially effective organization, urriments. vidence of command of knowledge and underst tions and mechanisms of organic chemistry. Stad little or no ability to analyze novel problems. Sminimal or no organization, understanding an Details	show evidence of limited ability correct but also erroneous use derstanding and application of la anding of essential facts and co low little or no evidence of ability show little or no lab skills and application of lab skills and	to integrate knowledg of knowledge to solv ab skills and technique ncepts pertaining to the to apply and integrat ty to solve most familia techniques in organi No. of Hours 36 12 100 Assessment Methods to CLO Mappine	
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-b Activitie Lectures Tutorials Reading Methods	chemical properties, reac and theory, and a limited most familiar problems. D in organic chemistry experiments in organic chemistry experiments in the properties, react knowledge and theory, an problems. Demonstrate richemistry experiments. Dased course ps. 3.5.6.7.7 Self study	tions and mechanisms of organic chemistry. Sability to analyze novel problems. Show some emonstrate a partially effective organization, unriments. vidence of command of knowledge and underst tions and mechanisms of organic chemistry. Shid little or no ability to analyze novel problems. Sminimal or no organization, understanding an Details Details	show evidence of limited ability correct but also erroneous use derstanding and application of la anding of essential facts and co low little or no evidence of ability show little or no evidence of ability of application of lab skills and weight of a bility of application of lab skills and weighting in final course grade (%)	to integrate knowledge of knowledge to solvab skills and technique neepts pertaining to the to apply and integrat to to apply and integrat to solve most familia techniques in organi No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6,	
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-b Activitie Lectures Tutorials Reading Methods Assignm	chemical properties, reac and theory, and a limited most familiar problems. D in organic chemistry experiments in organic chemistry experiments in the properties, react knowledge and theory, an problems. Demonstrate richemistry experiments. Dased course ps. 3.5.6.7.7 Self study	tions and mechanisms of organic chemistry. Sability to analyze novel problems. Show some emonstrate a partially effective organization, unriments. vidence of command of knowledge and underst tions and mechanisms of organic chemistry. Shid little or no ability to analyze novel problems. Sminimal or no organization, understanding an Details Details	show evidence of limited ability correct but also erroneous use derstanding and application of la anding of essential facts and co low little or no evidence of ability show little or no evidence of ability of application of lab skills and Weighting in final course grade (%)	to integrate knowledge to solve of knowledge to solve be kills and technique to be knowledge to solve be kills and technique to the property of the paper of the property of t	
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Fail Lecture-b Activitie Lectures Tutorials Reading Methods Assignm Examina Test	chemical properties, reac and theory, and a limited most familiar problems. D in organic chemistry experiments of the most familiar problems of the most rate little or no exchemical properties, reach knowledge and theory, an problems. Demonstrate richemistry experiments. Dassed course Solation A Self study Solation Chemistry", by Paula	tions and mechanisms of organic chemistry. Sability to analyze novel problems. Show some emonstrate a partially effective organization, unriments. vidence of command of knowledge and underst tions and mechanisms of organic chemistry. Shid little or no ability to analyze novel problems. Sminimal or no organization, understanding an Details Details	Show evidence of limited ability correct but also erroneous use derstanding and application of la anding of essential facts and convolution of the	to integrate knowledge to fix of knowledge to solvable skills and technique to the skills and technique to the skills and technique to the skills and technique to to apply and integrally to solve most familiate techniques in organical techniques	
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended	Fail Lecture-b Activitie Lectures Tutorials Reading Methods Assignm Examina Test "Organic	chemical properties, reac and theory, and a limited most familiar problems. D in organic chemistry experiments of the most familiar problems of the most rate little or no exchemical properties, reach knowledge and theory, an problems. Demonstrate richemistry experiments. Dassed course Solation A Self study Solation Chemistry", by Paula	tions and mechanisms of organic chemistry. Sability to analyze novel problems. Show some emonstrate a partially effective organization, unriments. vidence of command of knowledge and underst tions and mechanisms of organic chemistry. Show it little or no ability to analyze novel problems. Sminimal or no organization, understanding an Details Details (Assignments and participation)	Show evidence of limited ability correct but also erroneous use derstanding and application of la anding of essential facts and convolution of the	to integrate knowledge to solve of knowledge to solve be kills and technique to the kills and technique to the kills and integrate to solve most familit techniques in organ No. of Hours 36 12 100 Assessment Methods to CLO Mappin CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6	

CHEM2442	Fundamentals of organic chemistry (6 credits)	2020	
Offering Department	Chemistry	Quota	100
Course Co-ordinator	Dr P H Toy, Chemistry (phtoy@hku.hk)		
Teachers Involved	(Dr P H Toy, Chemistry)		
Course Objectives	The major objective of this course is to give the students a basic understanding the context of daily life. This will be achieved through the introduction of the chat that form the basis of organic molecules. The concepts presented in the lectur laboratory experiments.	emistry of organic	functional groups

Course Contents & Topics	The chemistry of organic functional groups such as alkenes, alkynes, alkyl halides, alcohols, aldehydes, ketones, carboxylic acids and their derivatives, and amines will be discussed, as will the general concepts of molecular						
-	structure, o	conformation and stere	ochemistry.		· ·	•	
Course Learning		On successful completion of this course, students should be able to:					
Outcomes	CLO 1	demonstrate basic und	lerstanding of the str	ucture of organic m	olecules		
	CLO 2	demonstrate basic und	lerstanding of the rea	ctivity of organic m	olecules		
	CLO 3	appreciate how organi	c chemistry plays an	important role in ev	eryday life		
Pre-requisites (and Co-requisites and Impermissible combinations)		HEM1042; and dents who have passed	d CHEM2441, or have	e already enrolled i	n this course.		
Offer in 2020 - 2021	Y 1st s	sem Offer in 2021 - 2	022 : Y		Examination	Dec	
Grade Descriptors (A+ to F)	A	Demonstrate thorough mas all the course learning out thought, and ability to apply	comes. Show strong and	lytical and critical abili	ties and logical thinking, v		
	В	Demonstrate substantial co most of the course learning knowledge to familiar and s	outcomes. Show evidend				
	С	Demonstrate general but incomplete command of organic chemistry knowledge, and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar problems.					
	Demonstrate partial but limited command of organic chemistry knowledge, and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems.						
	Fail Demonstrate little or no evidence of command of organic chemistry knowledge, and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems.						
Course Type	Lecture wit	th laboratory componer	nt course				
Course Teaching	Activities		Details			No. of Hours	
& Learning Activities	Lectures					24	
	Laboratory	у				20	
	Tutorials					5	
	Reading /	Self study				100	
Assessment Methods and Weighting	Methods	·	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examination				60	CLO 1,2,3	
	Test		Test/Quiz		40	CLO 1,2,3	
Required/recommended reading and online materials		Y.; Essential Organic C	,,	,			
Additional Course Information	Laboratory	who are planning to take or classes are mandator ass this course.			nents and take a writ	ten laboratory test in	

CHEM2443	(6 cred	nentals of organic chemistry for ph ts)	armacy students	Academic Year	2020		
Offering Department	Chemist	,		Quota	60		
Course Co-ordinator		by, Chemistry (phtoy@hku.hk)		4444			
Teachers Involved		oy,Chemistry)					
Course Objectives	especial functiona	or objective of this course is to give pha in the context of daily life. This will be groups that form the basis of organic by a series of laboratory experiments.	achieved through the intro	oduction of the che	mistry of organic		
Course Contents & Topics	carboxyl	The chemistry of organic functional groups such as alkenes, alkynes, alkyl halides, alcohols, aldehydes, ketones, carboxylic acids and their derivatives, and amines will discussed, as will the general concepts of molecular structure, conformation and stereochemistry.					
Course Learning	On succe	ssful completion of this course, students sl	hould be able to:				
Outcomes	CLO 1	demonstrate basic understanding of structure	cture of organic molecules				
	CLO 2	demonstrate basic understanding of the i	reactivity of organic molecu	ules			
	CLO 3	appreciate how organic chemistry plays a	an important role in everyd	ay life			
Pre-requisites	Pass in 0	CHEM1042; and					
(and Co-requisites and Impermissible combinations)	Not for s (This cou	udents who have passed CHEM2442, or a rse is for BPharm students only)	lready enrolled in this cour				
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	Not for s (This cou	udents who have passed CHEM2442, or a rse is for BPharm students only) fer in 2021 - 2022 : N	,	Examination			
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Not for s (This cou	udents who have passed CHEM2442, or a rse is for BPharm students only)	evel of extensive organic chemist analytical and critical abilities ar	Examination ry knowledge, and skills nd logical thinking, with			
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Not for s (This cou	udents who have passed CHEM2442, or a rse is for BPharm students only) fer in 2021 - 2022 : N Demonstrate thorough mastery at an advanced le all the course learning outcomes. Show strong	evel of extensive organic chemist analytical and critical abilities an ange of complex, familiar and unt mistry with a broad range of know ence of analytical and critical ab	Examination ry knowledge, and skills nd logical thinking, with familiar problems. vledge, and skills require	evidence of original		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Not for s (This cou	udents who have passed CHEM2442, or a rse is for BPharm students only) fer in 2021 - 2022 : N Demonstrate thorough mastery at an advanced le all the course learning outcomes. Show strong a thought, and ability to apply knowledge to a wide rough to be most of the course learning outcomes. Show evidences of the course learning outcomes. Show evidences is shown and of organic chemost of the course learning outcomes. Show evidences is shown as the course learning outcomes.	evel of extensive organic chemist analytical and critical abilities at ange of complex, familiar and unlimistry with a broad range of knowence of analytical and critical abis.	Examination ry knowledge, and skills nd logical thinking, with familiar problems. vledge, and skills require ilities and logical thinking and skills required for a	evidence of original of original of or attaining at leas or and ability to apply attaining most of the		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Not for s (This cou N O	udents who have passed CHEM2442, or a rse is for BPharm students only) fer in 2021 - 2022 : N Demonstrate thorough mastery at an advanced le all the course learning outcomes. Show strong thought, and ability to apply knowledge to a wide representation of the course learning outcomes. Show evidence of scourse learning outcomes. Show evidenstrate general but incomplete command of course learning outcomes. Show evidence of scourse learning outcomes.	evel of extensive organic chemist analytical and critical abilities an ange of complex, familiar and unimistry with a broad range of knowence of analytical and critical abis. of organic chemistry knowledge, ome analytical and critical abilitinic chemistry knowledge, and skrent and logical thinking, but with	Examination ry knowledge, and skills nd logical thinking, with familiar problems. vledge, and skills require illities and logical thinking, and skills required for as and logical thinking, kills required for attaining.	evidence of original d for attaining at leas g, and ability to apply attaining most of the and ability to apply g some of the course		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Not for s (This cou N O A B	udents who have passed CHEM2442, or a rse is for BPharm students only) fer in 2021 - 2022 : N Demonstrate thorough mastery at an advanced le all the course learning outcomes. Show strong thought, and ability to apply knowledge to a wider to be a most of the course learning outcomes. Show evidence to familiar and some unfamiliar problem Demonstrate general but incomplete command course learning outcomes. Show evidence of so knowledge to most familiar problems. Demonstrate partial but limited command of orgal learning outcomes. Show evidence of some cohe learning outcomes. Show evidence of some cohe	evel of extensive organic chemist analytical and critical abilities at ange of complex, familiar and untimistry with a broad range of know ence of analytical and critical abiss. of organic chemistry knowledge, one analytical and critical abilitinic chemistry knowledge, and skrent and logical thinking, but with s. of organic chemistry knowledge,	Examination ry knowledge, and skills nd logical thinking, with familiar problems. vledge, and skills require illities and logical thinking and skills required for as and logical thinking, kills required for attaining in limited analytical and contained and skills required for and skills required for attaining in limited analytical and contained in the skills required for and skills required for and skills required for and skills required for	evidence of original d for attaining at leas g, and ability to apply attaining most of the and ability to apply g some of the course critical abilities. Show attaining the course		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Not for s (This could be could	udents who have passed CHEM2442, or a rse is for BPharm students only) fer in 2021 - 2022 : N Demonstrate thorough mastery at an advanced le all the course learning outcomes. Show strong at thought, and ability to apply knowledge to a wider most of the course learning outcomes. Show evid knowledge to familiar and some unfamiliar problem Demonstrate general but incomplete command of course learning outcomes. Show evidence of so knowledge to most familiar problems. Demonstrate partial but limited command of orga learning outcomes. Show evidence of some cohe limited ability to apply knowledge to solve problem. Demonstrate little or no evidence of command clearning outcomes. Lack of analytical and critical	evel of extensive organic chemist analytical and critical abilities at ange of complex, familiar and untimistry with a broad range of know ence of analytical and critical abiss. of organic chemistry knowledge, one analytical and critical abilitinic chemistry knowledge, and skrent and logical thinking, but with s. of organic chemistry knowledge,	Examination ry knowledge, and skills nd logical thinking, with familiar problems. vledge, and skills require illities and logical thinking and skills required for as and logical thinking, kills required for attaining in limited analytical and contained and skills required for and skills required for attaining in limited analytical and contained in the skills required for and skills required for and skills required for and skills required for	evidence of original d for attaining at leas g, and ability to apply attaining most of the and ability to apply g some of the course critical abilities. Show attaining the course		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Not for s (This could be could	udents who have passed CHEM2442, or a rse is for BPharm students only) fer in 2021 - 2022 : N Demonstrate thorough mastery at an advanced le all the course learning outcomes. Show strong a thought, and ability to apply knowledge to a wide r. Demonstrate substantial command of organic che most of the course learning outcomes. Show evid knowledge to familiar and some unfamiliar problem Demonstrate general but incomplete command course learning outcomes. Show evidence of sknowledge to most familiar problems. Demonstrate partial but limited command of orgal learning outcomes. Show evidence of some cohe limited ability to apply knowledge to solve problem. Demonstrate little or no evidence of command of learning outcomes. Lack of analytical and critical knowledge to solve problems.	evel of extensive organic chemist analytical and critical abilities at ange of complex, familiar and untimistry with a broad range of know ence of analytical and critical abiss. of organic chemistry knowledge, one analytical and critical abilitinic chemistry knowledge, and skrent and logical thinking, but with s. of organic chemistry knowledge,	Examination ry knowledge, and skills nd logical thinking, with familiar problems. vledge, and skills require illities and logical thinking and skills required for as and logical thinking, kills required for attaining in limited analytical and contained and skills required for and skills required for attaining in limited analytical and contained in the skills required for and skills required for and skills required for and skills required for	evidence of original d for attaining at leas g, and ability to apply attaining most of the and ability to apply g some of the course critical abilities. Show attaining the course		

	Laboratory			20
	Tutorials			5
	Reading / Self study			100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Examination		60	CLO 1,2,3
	Test	Test/Quiz	40	CLO 1,2,3
Required/recommended reading and online materials	Bruice, P.Y.; Essential Organic Ch	nemistry (Pearson, 2016, 3rd edition)	
Additional Course	Laboratory classes are mandatory	y. Students must complete ALL ex	periments and laboratory	reports to pass this
Information	course.			

CHEM2541	Introduc	tory physical chemistry (6 credits)	ademic Year	2020		
Offering Department	Chemistry		ıota	100		
Course Co-ordinator		ng (2nd sem), Chemistry (jinyao@hku.hk)				
Teachers Involved		ng,Chemistry)				
Course Objectives	Students a chemical reproperties dynamics.	se aims to provide a rigorous understanding of equilibrium thermodyr are required to apply mathematical skills (derivations and integrations) are reactions and related processes. Topics include the three laws of the of mixtures, solutions, chemical equilibrium, electrochemistry, rates of c Students will gain a good foundation of knowledge and skills for further st	nd basic physi ermodynamics chemical reacti	cs to understand thermodynamic ons and reactior		
Course Contents & Topics	Properties States of g	of Gases gases and the gas laws with applications.				
	Basic cond	Law of Thermodynamics cepts of work, heat transactions, enthall in relation to biochemistry and materials science.	py and adiaba	itic changes and		
		nd and Third Laws of Thermodynamics of spontaneous change, entropy and the Third Law of Thermodynamics.				
		xtures namic description of mixtures, partial molar quantities, and chemical po olute, regular solutions and ions in solution.	otentials of liqu	uids. Activities of		
	Chemical Equilibrium Spontaneous chemical reactions, the Gibbs energy minimum and equilibrium. Response of equilibria to pressure, temperature.					
	Electrochemistry Electrochemical cell, relationship of electrochemical potential to thermodynamic functions. Applications of electrochemistry in energy, material science, sensing.					
	Molecules in Motion Molecular motion in gases and liquids, kinetic model, collisions with surfaces, the rate of effusion and transport properties, conductivities of electrolyte solutions.					
	Rates of Chemical Reactions Empirical chemical kinetics including experimental methods, rates of reactions, integrated rate laws and temperature dependence of reactions and Reaction mechanism					
Course Learning Outcomes	CLO 1 de	esful completion of this course, students should be able to: emonstrate knowledge and understanding of the properties of gases, molechemical reactions	lecules in moti	on and the rates		
	CLO 2 understand and demonstrate knowledge of the three laws of thermodynamics					
	CLO 3 understand and apply the concepts of chemical equilibrium and the response of chemical equilibria to temperature and pressure					
	CLO 4 understand and demonstrate knowledge of electrochemistry and its relationship to thermodynamics, can build electrochemical cell and calculate thermodynamic functions from electrochemical reactions					
Due ve avieltee	CLO 5 demonstrate knowledge and understanding of basic reaction dynamics including reaction mechanism and how mechanism determines reaction rate law Pass in CHEM1042; and NOT for students who have passed CHEM2041, or already enrolled in this course (for					
Pre-requisites (and Co-requisites and Impermissible combinations)	students a Pass in Cl	newrouse, and NOT for students who have passed Chew2041, or alle idmitted in 2014-15 or before); HEM1042 and CHEM1043; and NOT for students who have passed CH e (for students admitted in 2015-16 or thereafter)				
Offer in 2020 - 2021			amination	May		
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills learning outcomes. Show thorough grasp of the subject. Demonstrate strong analytical a with ability to apply knowledge to a wide range of complex, familiar and unfamiliar situation	nd critical abilities	and logical thinking		
	В	Demonstrate substantial command of a broad range of knowledge and skills required fo learning outcomes. Show substantial grasp of the subject. Demonstrate evidence of and thinking, and ability to apply knowledge to familiar and some unfamiliar situations.	alytical and critica	l abilities and logical		
	С	Demonstrate general but incomplete command of knowledge and skills required for a outcomes. Show general but incomplete grasp of the subject. Demonstrate evidence of slogical thinking, and ability to apply knowledge to most familiar situations.	ome analytical an	d critical abilities and		
	D	Demonstrate partial but limited command of knowledge and skills required for attaining s Show partial but limited grasp, with retention of some relevant information, of the sub- coherent and logical thinking, but with limited analytical and critical abilities. Show limited problems.	bject. Demonstrat	e evidence of some		
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attainin evidence of little or no grasp of the knowledge and understanding of the subject. Lack or and coherent thinking. Show very little or no ability to apply knowledge to solve problems.				

Course Type	Lecture-based course			
Course Teaching	Activities	No. of Hours		
& Learning Activities	Lectures			36
	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		30	CLO 1,2,3,4
	Examination		50	CLO 1,2,3,4
	Test		20	CLO 1,2
Required/recommended reading and online materials	"Physical Chemistry" by P.	W. Atkins, latest edition		

CHEM3141	Environ	mental chemistry (6	credits)	Academic Ye	ar 2020
Offering Department	Chemistry		·	Quota	50
Course Co-ordinator	Dr Y X Li,	Chemistry (yxpli@hku.h	nk)		
Teachers Involved		han,Chemistry) Chemistry)			
Course Objectives			to Environmental Chemistry ronmental phenomena and pro	and enables them to underscesses.	stand the chemical
Course Contents & Topics	Atmosphere chemistry: atmospheric composition and behavior, ozone in the stratosphere, chemistry of the troposphere, air pollution Water Chemistry: property of water, water resources and cycle, chemical quality of natural water, acid-base chemistry, oxidation-reduction chemistry, water purification Organic pollutants: persistent organic pollutants, pesticides, toxicology Energy: energy resources, fossil fuels, solar energy, nuclear energy, energy conversion (heat engine, fuel cells) Waste treatment: domestic and hazardous waste treatment (landfill, incineration, air stripping, adsorption, oxidation)				
Course Learning	On succes	sful completion of this of	course, students should be able	e to:	
Outcomes	CLO 2 de en CLO 3 cri	scribe the practical pro ergy production tically discuss local and	ocesses of chemistry in atmo	rious environmental phenomen sphere, water purification, wa ased on scientific principles and d in various environmental prob	ste treatment, and
Pre-requisites (and Co-requisites and Impermissible combinations)			1 or CHEM2441 or CHEM2442	or CHEM2541	
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	2022 : Y	Examination	May
Grade Descriptors (A+ to F)	В	evidence Show evidence wide range of complex, fami - Demonstrate substantial g evidence of analytical abiliti	of strong analytical abilities, logical a iliar and unfamiliar situations Demon grasp of the subject Demonstrate ge	gration of the full range of appropriate and independent thinking, and ability i strate highly effective organization and oreral integration of theories, principle ce of independent thinking, and ability anization and presentation skills.	to apply knowledge to a presentation skills. s, and evidence Show
	Demonstrate general but incomplete grasp of the subject Demonstrate some partial integration of theories, principles, and evidence Show evidence of some analytical abilities and logical thinking, little evidence of independent thinking, and ability to apply knowledge to most familiar situations Demonstrate moderately effective organization and presentation skills.				
	 Demonstrate partial but limited grasp, with retention of some relevant information, of the subject Demonstrate limited integration of theories, principles, and evidence Show evidence of limited analytical abilities, little or no evidence of independent thinking, and limited ability to apply knowledge to solve problems Demonstrate limited or barely effective organization and presentation skills. 				
	Fail	theories, principles, and evil little or no ability to apply known	idence Show little or no evidence of	ding of the subject Demonstrate litt analytical abilities, logical and indepe rate incoherent organization and poor	ndent thinking, and very
Course Type		ased course			
Course Teaching	Activities	i	Details		No. of Hours
& Learning Activities	Lectures			36	
	Tutorials				12
	Reading /	Self study			100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignme	nts	(poster presentation)	40	CLO 1,2,3,4
	Examinat	on		60	CLO 1,2,3,4
Required/recommended reading and online materials			ental Chemistry, Freeman, lates emistry, Lewis Publishers, lates		

CHEM3142	Chemical process industries and analysis (6 credits)	Academic Year	2020
Offering Department	Chemistry	Quota	60
Course Co-ordinator	Prof G K Y Chan, Chemistry (hrsccky@hku.hk)		
Teachers Involved	(Prof G K Y Chan,Chemistry) (Visiting Professor,Chemistry)		
Course Objectives	To familiarize with typical chemical industries important in local and glob technology of chemicals manufacturing and chemical processes in general industries.		understand the
Course Contents & Topics	Process flow charts, units and conversions, materials and energy balances, unit processes to include variation in products, scale, and types of operation, industrial gases, beverage processes, chloroalkaline manufacturing.	•	

Course Learning			is course, students should be able to				
Outcomes	CLO 1 solve basic problems of energy and mass balances in chemical and environmental processes CLO 2 be familiarized with a few common chemical industries and chemical processes						
			eral principles of industrial practice the	V 1			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in C	Pass in CHEM2241 or CHEM2341 or CHEM2441 or CHEM2442 or CHEM2541					
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021	- 2022 : Y	Examination	May		
Grade Descriptors (A+ to F)	A	attaining all of the cours original thought, and abi	knowledge of industrial chemical processes a se learning outcomes. Show strong analytica ility to apply knowledge to solve problems in sourcing of references. Apply highly effective	ll and critical abilities and logical t a wide range of complex, familiar	hinking, with evidence of and unfamiliar situations.		
	В	for attaining at least mos and ability to apply know	I knowledge of industrial chemical processes st of the course learning outcomes. Show evi wledge to solve problems in familiar and som ve organizational and presentational skills.	dence of analytical and critical ab	lities and logical thinking,		
	С	skills required for attaini logical thinking, and abili	at incomplete knowledge of industrial chemic ing most of the course learning outcomes. S ity to apply knowledge solve problems to mos Apply moderately effective organizational and	Show evidence of some analytical st familiar situations. Mostly correct	and critical abilities and		
	Demonstrate partial but limited knowledge of industrial chemical processes and command of mass and energy balance skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Limited ability to use data and source references. Apply limited or barely effective organizational and presentational skills.						
	Fail	skills required for attaini Show very little or no	evidence of knowledge of industrial chemic ing the course learning outcomes. Lack of an ability to apply knowledge to solve problem inimally effective or ineffective.	nalytical and critical abilities, logic	al and coherent thinking.		
Course Type	Lecture w	ith laboratory compor	nent course				
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures			24			
	Laborator	ry	computational laboratory	12			
	Field wor	·k	1 - 2 plant visits	12			
	Reading /	/ Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	(Continuous Assessment)	15	CLO 1,2		
	Examinat	tion		50	CLO 1,2,3		
	Laboratory reports			5	CLO 2,3		
	Test		(test/quiz)	30	CLO 1,2		
reading and	Felder and	d Rousseau: Element	tary Principles of Chemical Processe	es			
online materials		poratory courses are mandatory. Students must complete ALL experiments and laboratory reports to pass this					

CHEM3143	Introduct	ion to materials chen	nistry (6 credits)		Academic Year	2020	
Offering Department	Chemistry				Quota	60	
Course Co-ordinator	Dr Y F Wa	ng, Chemistry <i>(wanglab</i> @	hku.hk)				
Teachers Involved	(Dr Y F Wa	ng,Chemistry)					
Course Objectives	various typ		to materials chemistry. Their structure, synthesis, a course.				
Course Contents & Topics	properties;	alloys and ceramics; int	of crystalline solids; phases roduction to soft matter; r; applications of materials;	structure, synthe	sis, and propert		
Course Learning	On succes	ful completion of this coul	rse, students should be ab	le to:			
Outcomes			classification and their ucture/property relationship		uctures, and pro	perties, and to	
			nd phases, phase transforr				
	CLO 3 understand defects in crystalline solid materials and relate them with mechanical properties						
	CLO 4 appreciate soft materials and some examples and characteristics						
	CLO 5 understand the concept of molecular weight distribution in polymers, and explain the effect of polymerization kinetics to their properties						
	CLO 6 identify examples of some important materials, and explain their structure-property relationship						
	CLO 7 dei	nonstrate knowledge in ma	aterials characterizations				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Ch	EM2441; and Pass in CHI	EM2541 or CHEM2341				
Offer in 2020 - 2021	Y 1st s	em Offer in 2021 - 2022	: Y		Examination	Dec	
Grade Descriptors (A+ to F)	Α	deep understanding of materials classical solid materials and s common polymers. Demonstrate of materials. Show strong ability	ge of essential facts, concepts, pis s structures at different length sca soft materials. Show extensive e strong ability to apply/integrate v to analyze novel problems and materials synthesis/characterizat	ales and the relationsl knowledge in synthe knowledge and theor critical use of data/ex	nip with materials pro esis, characterization y related to the synth	perties particularly for and applications of lesis and applications	
	В	Demonstrate thorough knowledge understanding of materials classical solid materials and scommon polymers. Demonstrat	ge of essential facts, concepts, pr s structures at different length sca soft materials. Show extensive se evidence to apply/integrate kni nalyze novel problems and criti	rinciples, and theories ales and the relationsl knowledge in synthe owledge and theory re ical use of data/expe	nip with materials pro esis, characterization elated to the synthes	perties particularly for and applications of is and applications of	

	С	classification of materials relationship with materials synthesis, characterization theory related to the synthemostly correct but errone synthesis/characterization.	Show some but insufficient underst properties particularly for classica and applications of common polylesis and applications of materials. Second use of data/experimental research	of essential facts, concepts, principles anding of materials structures at differe I solid materials and soft materials. S mers. Demonstrate evidence to apply/Show ability to analyze problems to me sults to draw appropriate conclusion	ent length scales and the how some knowledge in integrate knowledge and ost familiar situations and ns related to materials
	D	classification of materials. S materials properties partic characterization and applic and theory related to the	Show deep understanding of matericularly for classical solid materials ations of common polymers. Demosynthesis and applications of mate	essential facts, concepts, principles, als structures at different length scales is and soft materials. Show limited li- postrate evidence but limited ability to a prials. Show limited ability to analyze principle in principle in the propriate conclusion.	and the relationship with knowledge in synthesis, apply/integrate knowledge problems to most familiar
	Fail	classification of materials. S with materials properties pocharacterization and applic knowledge and theory relati	Show little or no understanding of n articularly for classical solid materia cations of common polymers. De ted to the synthesis and application:	of essential facts, concepts, principles naterials structures at different length stals and soft materials. Show little or no monstrate limited or no evidence of s of materials. Show little or no ability topriate and insightful conclusions	cales and the relationship knowledge in synthesis, ability to apply/integrate analyze novel problems
Course Type	Lecture-ba	ased course			
Course Teaching	Activities		Details	No. of Hours	
& Learning Activities	Lectures				36
	Tutorials				12
	Reading /	Self study			100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Examinat	on		70	CLO 1,2,3,4,5,6,7
	Test		(continuous assessment)	30	CLO 1,2,3,4,5,6,7
Required/recommended reading and online materials	F. W. Billn G. Odian:	est (continuous assessment) 30 CLO 1,2,3,4,5,6 D. Callister: Materials Science and Engineering: An Introduction (8th or 9th edition) W. Billmeyer: Textbook of Polymer Science (John Wiley and Sons, 1984) Odian: Principles of Polymerizations (John Wiley and Sons, 2004) P. Stevens: Polymer Chemistry: An Introduction (Oxford University Press, 1999)			

CHEM3146	Principles and applications of spectroscopic and analytical techniques (6 credits)				Academic Year	2020	
Offering Department	Chemistry	,			Quota	200	
Course Co-ordinator	Dr X Li, C	hemistry <i>(xiangli</i> @ <i>l</i>	nku.hk)				
Teachers Involved		, ,	,				
Course Objectives			applications of modern practical spectros nced chemistry courses.	scopic and	analytical techni	ques. This course	
Course Contents & Topics			roscopy, Nuclear Magnetic Resonance alysis, Molecular Formulas and analysis		py, Mass Spect	rometry, Infra-red	
Course Learning	On succe	ssful completion of t	this course, students should be able to:				
Outcomes	CLO 1 u	nderstand the basic	principles and applications of IR, UV/Vis	s, MS and N	IMR spectroscop	oic techniques	
	CLO 2 d	escribe and explain	the terminology of IR, UV/Vis, MS and N	NMR spectro	oscopies		
	CLO 3 p	erform chemical stru	ucture elucidation and analysis based on	uV/Vis, M	S and NMR spec	troscopic data	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in a	ny CHEM2XXX leve	n course				
Offer in 2020 - 2021	N Off	er in 2021 - 2022 : N	V		Examination		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations.						
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems.						
Course Type	Lecture-b	ased course					
Course Teaching	Activities	S	Details			No. of Hours	
& Learning Activities	Lectures					36	
	Tutorials					12	
	Reading	/ Self study				100	
Assessment Methods and Weighting	Methods	,	Details		ing in final grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents			15	CLO 1,2,3	
	Examination				70	CLO 1.2.3	
	Test		(2 guizzes)		15	CLO 1,2,3	
Required/recommended reading and conline materials	4th edition	n)	npman, George S. Kriz: Introduction to Sopy (Macmillan, 1991, 3rd ed.)	Spectroscop	y (Thomson Lea		
Additional Course Information	Suggeste	d follow-up course:	CHEM3241				

CHEM3241	Analytic	cal chemistry II: che	mical instrumentation (6 credit	ts) Academic Yea	r 2020		
Offering Department	Chemistry Quota 104						
Course Co-ordinator	Dr W T C	Dr W T Chan, Chemistry <i>(wtchan @hku.hk)</i>					
Teachers Involved		nu,Chemistry) Chan,Chemistry)					
Course Objectives			d applications of chemical instrument ciples, of instruments that are common				
Course Contents & Topics	spectrom Separation chromato Mass spe	Optical methods: Beer's Law; UV-visible, infrared, and atomic spectrometry; fluorescence; atomic mass spectrometry; grating spectrometer; photon detectors and thermal detectors. Separation methods: partition; chromatography theories; high performance liquid chromatography (HPLC) and gas chromatography (GC); instrumental set up of HPLC and GC. Mass spectrometry: fundamental concept of mass spectrometry; electrospray ionization (ESI) and matrix-assisted laser desorption ionization (MALDI); time-of-flight (TOF) and quadrupole (Q) mass analyzers.					
Course Learning			course, students should be able to:	(,			
Outcomes	CLO 1 ex CLO 2 de in	CLO 1 explain the principles of the optical methods, separation methods, and mass spectrometry CLO 2 describe the basic experimental set up and the properties of the basic components of the instruments use in the laboratory classes CLO 3 apply experimental skills in chemical analysis including sample preparation, standard solution preparation					
			d matrix effects correction (standard a		nation proparation		
Pre-requisites (and Co-requisites and Impermissible combinations)		HEM2241	,	,			
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20	022 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	 Demonstrate thorough grasp of the subject Show evidence of strong analytical abilities, logical and independent thinking, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations Demonstrate highly proficient lab skills and techniques and critical use of data and results to draw appropriate and insightful conclusions Demonstrate highly effective organization and presentation skills 						
	B - Demonstrate substantial grasp of the subject Show evidence of analytical abilities and logical thinking, some evidence of independent thinking, and ability to apply knowledge to familiar and some unfamiliar situations Demonstrate proficient lab skills and techniques and correct use of data and results to draw appropriate conclusions Demonstrate effective organization and presentation skills.						
	 Demonstrate general but incomplete grasp of the subject Show evidence of some analytical abilities and logical thinking, little evidence of independent thinking, and ability to apply knowledge to most familiar situations Demonstrate adequate lab skills and techniques and mostly correct but some erroneous use of data and results to draw appropriate conclusions Demonstrate moderately effective organization and presentation skills. 						
	D	 Demonstrate partial but limited grasp, with retention of some relevant information, of the subject Show evidence of limited analytical abilities, little or no evidence of independent thinking, and limited ability to apply knowledge to solve problems Demonstrate partially effective lab skills and techniques and limited ability to use data and results to draw appropriate conclusions Demonstrate limited or barely effective organization and presentation skills. 					
	Fail - Demonstrate little or no grasp of the knowledge and understanding of the subject Show little or no evidence of analytical abilities, logical and independent thinking, and very little or no ability to apply knowledge to solve problems Demonstrate minimally effective or ineffective lab skills and techniques and misuse of data and results and/or unable to draw appropriate conclusions Demonstrate incoherent organization and poor presentation skills.						
Course Type	Lecture w	rith laboratory componer	nt course				
Course Teaching	Activitie	S	Details		No. of Hours		
& Learning Activities	Lectures				24		
	Laborato	ry			28		
	Tutorials				6		
	Reading	/ Self study			100		
Assessment Methods	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
and Weighting				60			
and Weighting	Examina	tion		00	CLO 1,2,3		
and Weighting		tion ry reports	including an oral examination	25	CLO 1,2,3 CLO 1,2,3		
and Weighting			including an oral examination				
and Weighting Required/recommended reading and online materials	Laborato Test D.A. Skoo	ry reports og, F.K. Holler, S.R. Cro	including an oral examination uch: Principles of Instrumental Analys ller, and S.R. Crouch: Fundamental	25 15 is (Thomson, latest editio	CLO 1,2,3 CLO 1,2,3 n).		
Required/recommended reading and	Laborato Test D.A. Skoo D.A. Sko edition)	ry reports og, F.K. Holler, S.R. Crot og, D.M. West, F.J. Ho	uch: Principles of Instrumental Analys	25 15 is (Thomson, latest editio s of Analytical Chemistry	CLO 1,2,3 CLO 1,2,3 n). / (Thomson, lates		

CHEM3242	Food and water analysis (6 credits)	Academic Year	2020			
Offering Department	Chemistry	Quota	50			
Course Co-ordinator	Dr W T Chan, Chemistry (wtchan@hku.hk)					
Teachers Involved	(Dr W T Chan, Chemistry)					
Course Objectives	To cover areas in the application and new methodology development in an water analysis.	alytical chemistry with t	focus on food and			
Course Contents & Topics	Chemical Ánalysis in Practicing Laboratories: Use of standard methods, guidelines and standards for water analysis; good laboratory practice; reliability and quality issues in chemical analysis. Food Analysis: Requirement of nutritional labeling; determination of food nutritional value (e.g. total prot sodium content); detection of food adulteration and contamination (e.g. presence of banned addition undeclared components); recent issues and case studies in food analysis.					
	Water Analysis: Water quality standards; sampling, pretreatment, storage of water samples; theory and technologies for field, laboratory and automated analysis of selected types of water (e.g. drinking water, recreational water, waste water).					
	Analytical Method Development: Selection, application and combination of analytical (e.g. sample digestion, solid phase extraction) and instrumental (e.g. GC, LC, MS) techniques for food and water analysis; method validation (e.g. recovery analysis, analysis of certified reference materials)					
Course Learning	On successful completion of this course, students should be able to:					

Outcomes	CLO 1 identify and determine errors and uncertainty of analytical results							
	CLO 2		en to control quality and ensure relia					
	CLO 3	demonstrate a gener	ral knowledge in food and water ana	alysis				
	CLO 4	CLO 4 understand issues in public health protection related to chemical analysis						
	CLO 5	carry out analytical to	echniques used in practicing food a	nd water laboratories				
Pre-requisites	Pass in (CHEM2041 or CHEM2	241 or CHEM2341 or CHEM2441 o	or CHEM2541.				
(and Co-requisites and Impermissible combinations)	Please note that School of Biological Sciences stipulates that students who have passed in CHEM3242 are not allowed to take BIOL3209 Food and nutrient analysis.							
Offer in 2020 - 2021	Y 2r	nd sem Offer in 2021	- 2022 · Y	Examination	May			
Grade Descriptors	Α		thorough grasp of the knowledge and skill		,			
(A+ to F)		analysis to acquire accountcomes. Show strong	curate results with full interpretation for and analytical and critical abilities, logical thinking es and problems related to the analysis of	alytical application as described in ng and capability to apply knowled	n all the course learning ge learnt to solve a wide			
	В	learning outcomes. Sho	tial command of a broad range of knowledge w evidence of analytical and critical abilities omplex issues and problems related to the own in class work.	, logical thinking, and capability to a	apply knowledge learnt to			
	С	evidence of analytical a	command of knowledge and skills required nd critical abilities, logical thinking, and ability lated to the analysis of food and water. App	y to apply knowledge learnt to solve	a wide range of complex			
	D	Demonstrate a partial but limited command of knowledge and skills required for attaining some of the course learning outcome in Food and Water Analysis. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities Show limited ability to apply knowledge to solve problems related to the analysis of food and water. Apply limited or barely effective organization and presentation skill as shown in class work.						
	Fail	Lack of analytical and	evidence for the command of knowledge artifical abilities, logical and coherent thinking analysis of food and water. Organization ar	g. Show very little or no ability to a	apply knowledge to solve			
Course Type	Lecture	with laboratory compo	nent course					
Course Teaching	Activitie	•	Details		No. of Hours			
& Learning Activities	Lectures	3						
_	Laborate	orv			16			
	Tutorials	,			8			
	Reading	/ Self study			100			
Assessment Methods and Weighting	Method	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignm	nents		5	CLO 1,2,3,4			
	Examina			60	CLO 1,2,3,4			
	Laborate	ory reports	Experiment & Lab report	20	CLO 2,5			
	Test 15 CLO 1,2,3,4							
Required/recommended reading and conline materials	D. A. Skoog, D. M. West, F. J. Holler, S.R. Crouch: Fundamentals of Analytical Chemistry (Cengage Learning, latest edition) References to specialist texts and other published material will be made throughout the course.							
Additional Course Information		Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports to pass this						

CHEM3243	Introductory instrumental chemical analysis (6 credits)	Academic Year	2020				
Offering Department	Chemistry	Quota	30				
Course Co-ordinator	Dr X Li, Chemistry (xiangli@hku.hk)						
Teachers Involved	(Dr K C J Wong,Pharmacology and Pharmacy) (Dr X Li,Chemistry)						
Course Objectives	This course is designed for non-chemistry major students covering basic prir for chemical analysis. This course provides a general foundation for furth environmental sciences.						
Course Contents & Topics	Optical methods: Beer's Law; UV-visible, infrared, and atomic spectrometry; fluorescence; atomic mass spectrometry; grating spectrometer; photon detectors and thermal detectors. Separation methods: partition; chromatography theories; high performance liquid chromatography (HPLC) and ga chromatography (GC); instrumental set up of HPLC and GC. Mass spectrometry: fundamental concept of mass spectrometry; electrospray ionization (ESI) and matrix-assiste laser desorption ionization (MALDI); time-of-flight (TOF) and quadrupole (Q) mass analyzers. NMR: basic principle of nuclear magnetic resonance. Analysis and quality assurance: statistical analysis of small sets of data, control chart.						
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 explain the principles of the optical methods, separation methods, mass spectrometry, and NMR						
	CLO 2 describe the basic experimental set up and the properties of the basic components of the instruments used in the laboratory classes						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in CHEM2041 or CHEM2241; and Not for students who have passed CHEM3241, or have already enrolled in the	nis course.					
Offer in 2020 - 2021	Y 2nd sem Offer in 2021 - 2022 : Y	Examination	May				
Grade Descriptors (A+ to F)	 Demonstrate thorough grasp of the subject Show evidence of strong analytical abilities, logical and independent thinking, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations Demonstrate highly proficient lab skills and techniques and critical use of data and results to draw appropriate and insightful conclusions Demonstrate highly effective organization and presentation skills. 						
	 - Demonstrate substantial grasp of the subject Show evidence of analytical independent thinking, and ability to apply knowledge to familiar and some unfami and techniques and correct use of data and results to draw appropriate conclus presentation skills. 	liar situations Demonstra	ate proficient lab skills				
	C - Demonstrate general but incomplete grasp of the subject Show evidence of s evidence of independent thinking, and ability to apply knowledge to most familia						

		and techniques and mostly moderately effective organiz		ous use of data and results to draw appropriate kills.	conclusions Demonstrate		
	D	 Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Show evidence of limited analytical abilities, little or no evidence of independent thinking, and limited ability to apply knowledge to solve problems. Demonstrate partially effective lab skills and techniques and limited ability to use data and results to draw appropriate conclusions. Demonstrate limited or barely effective organization and presentation skills. 					
	Fail	abilities, logical and indepe	ndent thinking, and very ctive lab skills and tech	and understanding of the subject Show little \(\) little or no ability to apply knowledge to sol- niques and misuse of data and results and/or and poor presentation skills.	ve problems Demonstrate		
Course Type	Lecture wi	h laboratory componen	t course				
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures			24			
	Laboratory			28			
	Reading / Self study				100		
Assessment Methods and Weighting	Methods		Details	Weighting in fina course grade (%)			
	Examinati	on		70	CLO 1,2		
	Laborator	/ reports		15	CLO 1,2		
	Test			15	CLO 1,2		
Required/recommended reading and online materials		D.A. Skoog, F.K. Holler, S.R. Crouch: Principles of Instrumental Analysis (Thomson, latest edition). D.A. Skoog, D.M. West, F.J. Holler, and S.R. Crouch: Fundamentals of Analytical Chemistry (Thomson, latest edition)					
Additional Course Information	Laboratory course.	oratory classes are mandatory. Students must complete ALL experiments and laboratory reports to pass this					

CHEM3244	Analyt	ical techniques for pha	armacy students (6 credits)	Academic Ye	ar 2020			
Offering Department	Chemist	try		Quota	35			
Course Co-ordinator	Dr X Li,	Chemistry (xiangli@hku.hk	;)					
Teachers Involved		J Wong,Pharmacology and, Chemistry)	Pharmacy)					
Course Objectives	Samplin fluoresc	The course covers theories and practicals on various analytical techniques used in pharmaceutical industry. Sampling and data analysis, method validation with respect to regulatory guidelines, ultraviolet/visible, infrared, fluorescence, atomic spectrophotometry, separation techniques such as gas chromatography and liquid chromatography, and modern mass spectrometry with its applications in protein sequencing will be covered in this course.						
Course Contents & Topics	Analysis Optical s Separat Modern	Principles and applications of different analytical and measurement techniques in pharmaceutical sciences. Analysis and quality assurance: method validation, sampling, statistics, hypothesis tests Optical spectroscopy: Beer's law, UV/Vis, infrared, fluorescence, and atomic spectroscopy Separation and purification: gas chromatography and liquid chromatography Modern mass spectrometry: ionization techniques (ESI, MALDI), mass analysis techniques (TOF, quadrupole), protein sequencing.						
Course Learning	On succ	cessful completion of this co	ourse, students should be able to:					
Outcomes		separation techniques, and	nd understanding of principles of d modern mass spectrometry	, , , ,	•			
		in the laboratory classes	ental setup and the properties of the	'				
	CLO 3 apply experimental skills in experiments including sample preparation, standard solution preparation, instrument calibration, and matrix effect correction							
Pre-requisites (and Co-requisites and Impermissible combinations)		BPHM2136 ourse is for BPharm students	s only)					
Offer in 2020 - 2021	Y 2	nd sem Offer in 2021 - 20	22 : Y	Examination	May			
Grade Descriptors (A+ to F)	В	ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations Demonstrate highly proficient lab skills and techniques and critical use of data and results to draw appropriate and insightful conclusions Demonstrate highly effective organization and presentation skills.						
		and techniques and correct u		e conclusions Demonstrate e				
	С	and techniques and correct upresentation skills. - Demonstrate general but incevidence of independent thin	use of data and results to draw appropriate complete grasp of the subject Show evide king, and ability to apply knowledge to mo orrect but some erroneous use of data and	ence of some analytical abilities ost familiar situations Demons	ffective organization and and logical thinking, little strate adequate lab skills			
	C	and techniques and correct upresentation skills. - Demonstrate general but incevidence of independent thin and techniques and mostly or moderately effective organiza. - Demonstrate partial but liminanalytical abilities, little or no Demonstrate partially effective organization.	use of data and results to draw appropriate complete grasp of the subject Show evide king, and ability to apply knowledge to mo orrect but some erroneous use of data and	ence of some analytical abilities out familiar situations Demonst results to draw appropriate containing the subject Stimited ability to apply knowled ability to use data and resu	ffective organization and and logical thinking, little strate adequate lab skills nclusions Demonstrate Show evidence of limited ge to solve problems.			
		and techniques and correct upresentation skills. Demonstrate general but incevidence of independent thin and techniques and mostly comoderately effective organiza. Demonstrate partial but lim analytical abilities, little or no Demonstrate partially effective conclusions. Demonstrate little or no grabilities, logical and indepen minimally effective or ineffective or ineffective.	use of data and results to draw appropriate complete grasp of the subject Show evide king, and ability to apply knowledge to morrect but some erroneous use of data and tition and presentation skills. ited grasp, with retention of some relevant o evidence of independent thinking, and we lab skills and techniques and limited	ence of some analytical abilities out familiar situations Demonst results to draw appropriate cot information, of the subject Similarited ability to use data and result resentation skills. of the subject Show little or recomply knowledge to solve professional and results and/or units.	iffective organization and and logical thinking, little strate adequate lab skills nclusions Demonstrate Show evidence of limited ge to solve problems. Its to draw appropriate no evidence of analytica problems Demonstrate			
Course Type	D Fail	and techniques and correct upresentation skills. Demonstrate general but incevidence of independent thin and techniques and mostly comoderately effective organiza. Demonstrate partial but lim analytical abilities, little or no Demonstrate partially effective conclusions. Demonstrate little or no grabilities, logical and indepen minimally effective or ineffective or ineffective.	use of data and results to draw appropriate complete grasp of the subject Show evide king, and ability to apply knowledge to morrect but some erroneous use of data and tion and presentation skills. ited grasp, with retention of some relevant of evidence of independent thinking, and ver lab skills and techniques and limited mitted or barely effective organization and pasp of the knowledge and understanding dent thinking, and very little or no ability tive lab skills and techniques and misuse incoherent organization and poor presentation.	ence of some analytical abilities out familiar situations Demonst results to draw appropriate cot information, of the subject Similarited ability to use data and result resentation skills. of the subject Show little or recomply knowledge to solve profiled and results and/or units.	iffective organization and and logical thinking, little strate adequate lab skills nclusions Demonstrate Show evidence of limited ge to solve problems. Its to draw appropriate no evidence of analytica problems Demonstrate			
Course Teaching	D Fail	and techniques and correct upresentation skills. Demonstrate general but incevidence of independent thin and techniques and mostly comoderately effective organiza. Demonstrate partial but liminanalytical abilities, little or no Demonstrate partially effective conclusions. Demonstrate in Demonstrate little or no grabilities, logical and indepen minimally effective or ineffectionclusions. Demonstrate in with laboratory component	use of data and results to draw appropriate complete grasp of the subject Show evide king, and ability to apply knowledge to morrect but some erroneous use of data and tion and presentation skills. ited grasp, with retention of some relevant of evidence of independent thinking, and ver lab skills and techniques and limited mitted or barely effective organization and pasp of the knowledge and understanding dent thinking, and very little or no ability tive lab skills and techniques and misuse incoherent organization and poor presentation.	ence of some analytical abilities out familiar situations Demonst results to draw appropriate cot information, of the subject Similarited ability to use data and result resentation skills. of the subject Show little or recomply knowledge to solve profiled and results and/or units.	iffective organization and and logical thinking, little strate adequate lab skills nclusions Demonstrate Show evidence of limited ge to solve problems. Its to draw appropriate no evidence of analytica problems Demonstrate			
Course Teaching	D Fail	and techniques and correct upresentation skills. Demonstrate general but incevidence of independent thin and techniques and mostly comoderately effective organiza. Demonstrate partial but liminanalytical abilities, little or no Demonstrate partially effective conclusions. Demonstrate ii. Demonstrate little or no graabilities, logical and indepenminmally effective or ineffecticonclusions. Demonstrate iim with laboratory component iies	use of data and results to draw appropriate complete grasp of the subject Show evide king, and ability to apply knowledge to morrect but some erroneous use of data and tion and presentation skills. ited grasp, with retention of some relevant of evidence of independent thinking, and we lab skills and techniques and limited mitted or barely effective organization and pasp of the knowledge and understanding dent thinking, and very little or no ability tive lab skills and techniques and misuse ancherent organization and poor presentation.	ence of some analytical abilities out familiar situations Demonst results to draw appropriate cot information, of the subject Similarited ability to use data and result resentation skills. of the subject Show little or recomply knowledge to solve profiled and results and/or units.	and logical thinking, little strate adequate lab skills inclusions Demonstrate Show evidence of limited to draw appropriate to draw appropriate or evidence of analytica problems Demonstrate able to draw appropriate			
Course Teaching	D Fail Lecture	and techniques and correct upresentation skills. Demonstrate general but incevidence of independent thin and techniques and mostly comoderately effective organiza. Demonstrate partial but liminanalytical abilities, little or no Demonstrate partially effective conclusions. Demonstrate litt. Demonstrate little or no graabilities, logical and indepenminmally effective or ineffective or ineffec	use of data and results to draw appropriate complete grasp of the subject Show evide king, and ability to apply knowledge to morrect but some erroneous use of data and tion and presentation skills. ited grasp, with retention of some relevant of evidence of independent thinking, and we lab skills and techniques and limited mitted or barely effective organization and pasp of the knowledge and understanding dent thinking, and very little or no ability tive lab skills and techniques and misuse ancherent organization and poor presentation.	ence of some analytical abilities out familiar situations Demonst results to draw appropriate cot information, of the subject Similarited ability to use data and result resentation skills. of the subject Show little or recomply knowledge to solve profiled and results and/or units.	and logical thinking, little strate adequate lab skills inclusions Demonstrate Show evidence of limited tige to solve problems ilts to draw appropriate no evidence of analytica problems Demonstrate able to draw appropriate. No. of Hours			
Course Teaching	D Fail Lecture Activiti Lecture Laborat	and techniques and correct upresentation skills. Demonstrate general but incevidence of independent thin and techniques and mostly comoderately effective organiza. Demonstrate partial but liminanalytical abilities, little or no Demonstrate partially effective conclusions. Demonstrate litt. Demonstrate little or no graabilities, logical and indepenminmally effective or ineffective or ineffec	use of data and results to draw appropriate complete grasp of the subject Show evide king, and ability to apply knowledge to morrect but some erroneous use of data and tion and presentation skills. ited grasp, with retention of some relevant of evidence of independent thinking, and we lab skills and techniques and limited mitted or barely effective organization and plasp of the knowledge and understanding dent thinking, and very little or no ability tive lab skills and techniques and misuse ancherent organization and poor presentation.	ence of some analytical abilities out familiar situations Demonst results to draw appropriate cot information, of the subject Similarited ability to use data and result resentation skills. of the subject Show little or recomply knowledge to solve profiled and results and/or units.	and logical thinking, little strate adequate lab skills inclusions Demonstrate Show evidence of limited to ge to solve problems Its to draw appropriate to evidence of analytica problems Demonstrate able to draw appropriate. No. of Hours 24			
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	D Fail Lecture Activiti Lecture Laborat	and techniques and correct upresentation skills. - Demonstrate general but incevidence of independent thin and techniques and mostly comoderately effective organiza. - Demonstrate partial but liminanalytical abilities, little or no Demonstrate partially effective conclusions Demonstrate little or no grabilities, logical and indepenminmally effective or ineffectonclusions Demonstrate in with laboratory component in with laboratory component ites.	use of data and results to draw appropriate complete grasp of the subject Show evide king, and ability to apply knowledge to morrect but some erroneous use of data and tion and presentation skills. ited grasp, with retention of some relevant of evidence of independent thinking, and we lab skills and techniques and limited mitted or barely effective organization and plasp of the knowledge and understanding dent thinking, and very little or no ability tive lab skills and techniques and misuse ancherent organization and poor presentation.	ence of some analytical abilities out familiar situations Demonst results to draw appropriate cot information, of the subject Similarited ability to use data and result resentation skills. of the subject Show little or recomply knowledge to solve profiled and results and/or units.	and logical thinking, little strate adequate lab skills inclusions Demonstrate Show evidence of limited to solve problems. It is to draw appropriate on evidence of analytical problems Demonstrate able to draw appropriate with the solve problems Demonstrate able to draw appropriate with the solve problems and the solve problems and the solve problems and the solve problems and the solve problems and the solve problems and the solve problems are solve problems Demonstrate able to draw appropriate with the solve problems and the solve problems are solve problems Demonstrate able to draw appropriate with the solve problems are solve problems Demonstrate able to draw appropriate with the solve problems Demonstrate able to draw appropriate w			
Course Teaching & Learning Activities Assessment Methods	D Fail Lecture Activiti Lecture Laborat Reading	and techniques and correct upresentation skills. - Demonstrate general but incevidence of independent thin and techniques and mostly comoderately effective organization. - Demonstrate partial but liming analytical abilities, little or no Demonstrate partially effective conclusions Demonstrate little or no grabilities, logical and indepenminimally effective or ineffection conclusions Demonstrate in with laboratory component in the session of the	use of data and results to draw appropriate complete grasp of the subject Show evide king, and ability to apply knowledge to morrect but some erroneous use of data and tion and presentation skills. ited grasp, with retention of some relevant of evidence of independent thinking, and we lab skills and techniques and limited part of the knowledge and understanding a dent thinking, and very little or no ability tive lab skills and techniques and misuse incoherent organization and poor presentation.	ence of some analytical abilities set familiar situations Demons results to draw appropriate co to information, of the subject Similed ability to apply knowled ability to use data and resuresentation skills. of the subject Show little or not apply knowledge to solve profice of data and results and/or una on skills.	and logical thinking, little strate adequate lab skills inclusions Demonstrate Show evidence of limited to ge to solve problems. It to draw appropriate to evidence of analytical problems Demonstrate able to draw appropriate. No. of Hours 24 28 100 Assessment			

	Test	15	CLO 1,2,3
	D.A. Skoog, F.K. Holler, S.R. Crou D.A. Skoog, D.M. West, F.J. Holl edition).		
Additional Course Information	This course is for Pharmacy studer Laboratory classes are mandatory course.	periments and laboratory i	reports to pass this

Offering Department Course Co-ordinator Prof V W Vam, Chemistry (wwyam@hku.hk) Course Objectives This course is a continuation from CREM2341 Inorganic Chemistry I, with a more detailed breatment of gener This course is a continuation from CREM2341 Inorganic Chemistry I, with a more detailed breatment of gener Institute of the Course Course Controls Structure, bonding, magnetism and spectral properties of inorganic systems including examples in biointegral systems. Course Learning Outcomes Course Learning	CHEM3341	Inorgan	ic chemistry II (6 cre	edits)	Academic Yea	ar 2020	
Teachers Involved Or A M Y Yuen, Chemistry) This course is a continuation from CHEM2341 Inorganic Chemistry, it with a more detailed treatment of gener inorganic chemistry, with chemistry, with examples relevance to biological processes and material science, suited to the needs to continuation of the continuation of the continuation of the continuation of the continuation of the continuation of the continuation of the continuation of the continuation and organometallic compounds including mechanisms their reaction where appropriate. Sirculars, bonding, magnetism and spectral properties of inorganic systems including examples in bioincrgan systems. On successful completion of this course, students should be able to: CL0 1 demonstrate knowledge of chemistry of selected classes of inorganic, coordination and organometallic compounds. CL0 2 understand structure, bonding, magnetism and spectral properties of inorganic systems. CL0 3 understand rechanisms of selected chemical reactions that are essential to coordination and compounds and impermissible combinations. CL0 4 gain appropriate knowledge of coordination compounds in biological systems. Pass in CHEM2341 A Demonstrate horowing through two detected chemical reactions that are essential to coordination and impermissible combinations. A Demonstrate horowing through two detected chemical reactions that the two detected chemical reactions and magnetisms of the control of the cont		Chemistr	у		Quota	110	
Course Objectives This course is a continuation from CHEM2341 Inorganic Chemistry I, with a more detailed treatment of gener inorganic chemistry, with examples relevance to biological processes and material science, suited to the needs toose intending to extend their studies in chemistry. Course Contents Topics Chemistry of selected classes of inorganic, coordination and organometallic compounds including mechanisms their reaction where appropriate. Shructure, bonding, magnetism and spectral properties of inorganic systems including examples in bioinorgan systems. Course Learning Outcomes CLO a understand of the compounds CLO 3 understand of understand of the compounds CLO 3 understand of understand of the compounds CLO 3 understand of understand of mechanisms of selected chemical reactions that are essential to coordination and organometalitic compounds CLO 4 gain appropriate knowledge of chemistry of selected classes of inorganic systems CLO 4 gain appropriate knowledge of coordination compounds in biological systems Per-requisites and Co-requisites and Co-requisites CLO 4 gain appropriate knowledge of coordination compounds in biological systems Personal Court of the Court o				ram @hku.hk)			
inorganic chemistry, with examples relevance to biological processes and material science, suited to the needs those intending to extend their studies in chemistry. Chemistry of selected classes of inorganic, coordination and organometaliic compounds including mechanisms their reaction where appropriate. Structure, bonding, magnetism and spectral properties of inorganic systems including examples in bioinorgan systems. Course Learning Outcomes Course Learning Outcomes CLO 2 understand structure, bonding, magnetism and spectral properties of inorganic, coordination and organometaliic compounds CLO 2 understand structure, bonding, magnetism and spectral properties of inorganic systems CLO 3 understand structure, bonding, magnetism and spectral properties of inorganic systems CLO 4 gain appropriate knowledge of coordination compounds in biological systems Pere-requisites and Co-requisites and importantsible and important		,	•				
their reaction where appropriates. Structure, bonding, magnetism and spectral properties of inorganic systems including examples in bioinorgan systems. On successful completion of this course, students should be able to: CLO 1 (incompatible knowledge of chemistry of selected classes of inorganic, coordination and organometallic CLO 4 (incompatible knowledge of chemistry of selected classes of inorganic, coordination and organometallic compounds. CLO 4 understand structure, bonding, magnetism and spectral properties of inorganic systems CLO 4 (incompatible compounds). CLO 4 (incompatible compounds). Sea in CHEM/2341 Fass in CHEM/2341 Y 1st sem Offer in 2021 - 2022 : Y I st sem Offer in 2021 - 2022	Course Objectives	inorganic those inte	chemistry, with example ending to extend their stud	s relevance to biological processedies in chemistry.	es and material science, su	ited to the needs of	
Course Learning Outcomes CLO 1 demonstrate knowledge of chemistry of selected classes of inorganic, coordination and organometallic compounds CLO 2 understand structure, bonding, magnetism and spectral properties of inorganic systems CLO 3 understand structure, bonding, magnetism and spectral properties of inorganic systems CLO 3 understand structure, bonding, magnetism and spectral properties of inorganic systems CLO 4 gain appropriate knowledge of coordination compounds in biological systems CLO 4 gain appropriate knowledge of coordination compounds in biological systems Pre-requisites (And Co-requisites (And Co-requisites) (And C				norganic, coordination and organo	ometallic compounds includ	ling mechanisms of	
CLO 1 demonstrate knowledge of chemistry of selected classes of inorganic coordination and organometallic compounds CLO 2 understand structure, bonding, magnetism and spectral properties of inorganic systems CLO 3 understand mechanisms of selected chemical reactions that are essential to coordination and organometallic compounds CLO 4 gain appropriate knowledge of coordination compounds in biological systems Pre-requisites (and Co-requisites (and Co-requisites (and Co-requisites (and Inordination (CLO 4) gain appropriate knowledge of coordination compounds in biological systems Pass in CHEM2341 1st sem Offer in 2021 - 2022 Y 1st sem Offer in 2021 - 2022 Y 1st sem Offer in 2021 - 2022 Y 2st		, bonding, magnetism ar	nd spectral properties of inorganion	c systems including examp	oles in bioinorganic		
CLO 3 understand mechanisms of selected chemical reactions that are essential to coordination and organometalitic compounds and impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) A Demonstrate thorough knowledge and understanding of essential facts, concepts, principles, and theories relating to the most advanced foundation knowledge of inorganic chemistry, especially those related to structure and bording of inorganic chemistry. Show about the concepts of the more advanced foundation knowledge of inorganic chemistry. Show arong ability to apply used integrate knowledge and experimental results to draw appropriate and insightful conclusions relating to the experimental results to draw appropriate and insightful conclusions relating to the experimental results to draw appropriate and insightful conclusions relating to the experimental production and integrate interval public and inchanged integrate interval public and interval public and inchanged integrate interval public and interv	•	CLO 1 d	emonstrate knowledge o ompounds	of chemistry of selected classes of	of inorganic, coordination a	and organometallic	
Pre-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A* to F) A Demonstrate thorough knowledge and understanding of essential facts, concepts, principles, and theories relating to the most advanced foundation knowledge of inorganic chemistry, especially those related to structure and bonding of inorganic particular and several properties of inorgan systems including examples in bioinorganic systems. Show strong ability to apply and integrate knowledge and theories relating to the most advanced foundation knowledge of inorganic chemistry, especially those related to structure and erictar in foundation principles and knowledge of inorganic chemistry, especially those mistake to structure and exhaust of condition knowledge of inorganic chemistry. Demonstrate highly effective laboratory skills and techniques especially in the synthesis and reactivity study of inorganic compounds and male calculations, and thick characterization to the more advanced foundation knowledge of inorganic chemistry. Benonstrate highly effective laboratory skills and techniques especially in the synthesis and reactivity study of inorganic compounds and male complexes, and their characterization to the more advanced foundation knowledge of inorganic chemistry. Show evidence to analyze novel problems an are covered use of data and experimental results to draw appropriate conclusions relating to the essential and more advanced foundation knowledge of inorganic chemistry. Show evidence to analyze novel problems and complexes, conclusions relation by various specificosopic methods. C Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, and theories related to structure and bonding of horganic, coordination and organic chemistry. Show white the advanced foundation knowledge of inorganic chemistry is the certain of the structure and bonding of horganic, coordination knowledge of inorganic chemistry. Show ability analyze problems to most familiar sit		CLO 3 u	nderstand mechanisms rganometallic compounds	of selected chemical reactions	s that are essential to	coordination and	
(And Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Demonstrate thorough knowledge and understanding of essential facts, concepts, principles, and theories relating to the most advanced foundation and organometallic compounds; mechanisms of reactions; and magnetic and specific of invariant coordination and organometallic compounds; mechanisms of reactions; and magnetic and specifical properties of inorgan systems including examples in bioinorganic systems. Show ethors guilty to apply and integrate knowledge and thorough of data and experimental results to draw appropriate and insightful conclusions relating to the essential and more advanced foundation principles and knowledge of inorganic committees. Demonstrate highly federal elacitority, still and technique especially in the synthesis and reactivity study of inorganic compounds and metal complexes, and their characterization to the more advanced foundation knowledge of inorganic commounts and metal complexes, principles, and therein a norganic especially in the synthesis and reactivity study of inorganic commounts and metal complexes, principles, and therein a norganic especially in the synthesis and reactivity study of inorganic commounts and metal complexes, principles, and techniques especially in the more advanced foundation knowledge of inorganic chemistry. Specially libose related to situature and bonding inorganic especially into especial properties of inorganic systems including examples in bioinorganic especially becare related to should be a situation of inorganic especially study of inorganic chemistry. Demonstrate effective laboratory skills and techniques especially the especial estimate in the synthesis and reactivity study of inorganic compounds and metal complexes and the inorganic especially study of inorganic especially thore related to structure and bonding of inorganic especially thore related to structure and bonding of inorganic especially thore related to structure and bonding inorgani	Due ve avrieit	-	· · · · · · · · · · · · · · · · · · ·	e of coordination compounds in bi	ological systems		
Grade Descriptors (A+ to F) Demonstrate through knowledge of inorganic chemistry, especially those related to structure and bonding of inorganic conditions and organic foundation knowledge of inorganic chemistry. Sepecially those related to structure and bonding of inorganic systems including examples in bioinorganic systems. Show strong ability to analyze novel problems and ordical use more advanced foundation knowledge of norganic chemistry. Show strong ability to analyze novel problems and ordical use foundation principles and knowledge of norganic chemistry. Show strong ability to analyze novel problems and ordical use specially in the synthesis and reactivity study of inorganic compounds and metal complexes, and their characterization to various specioscopic methods. B Demonstrate substantial command of knowledge of norganic chemistry, become take highly those related to structure and bonding in inorganic systems including examples in bioinorganic systems. Show evidence to apply and integrate knowledge and theore relating to the more advanced foundation knowledge of inorganic chemistry, between the indigrate knowledge and theore relating to the more advanced foundation knowledge of inorganic chemistry, show evidence to analyze movel problems are correct use of data and experimental results to draw appropriate conclusions relating to the synthesis and reactivity study of inorganic compounds and metal complexes, and their characterization by various specially those related to structure and bonding of inorganic care and reactivity study of inorganic compounds and metal complexes, and their characterization by various specially those related to structure and bonding of inorganic careful special plus to the several plus and the complexes and the contration of inorganic chemistry. Show allies a bonding of inorganic conditions relating to the more advanced foundation knowledge of inorganic chemistry. Show allies a bonding of inorganic contrate moderately properties conclusions relating to the more advanced foun	Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in C	:HEM2341				
advanced foundation knowledge of inorganic chemistry, especially those related to structure and bording of inorganic systems including examples in bioinorganic systems. Show strong ability to apply and integrals inoperated or inorganic systems. Show strong ability to apply and integrals inorganic and specifical properties of inorganic chemistry. Bemonstrate highly effective laboratory skills and techniques especially in the synthesis and reactivity study of inorganic compounds and their characterization to the more advanced foundation principles and knowledge of inorganic chemistry. Demonstrate highly effective laboratory skills and technique especially in the synthesis and reactivity study of inorganic compounds and their characterization to the more advanced foundation knowledge and understanding of essential facts, concepts, principles, and theories relation to the more advanced foundation knowledge of inorganic chemistry, especially those related to structure and bonding inorganic systems including examples in bioinorganic systems. Show evidence to apply and integrate knowledge and the relating to the more advanced foundation knowledge of inorganic chemistry. Show evidence to analyze novel problems are correct use of data and experimental results to draw appropriate conductions relating to the essential and consideration and considerations and the complexes, and their characterization by an expertise consideration and complexes and knowledge and the experimental results to the more advanced foundation principles and knowledge of inorganic compounds and metal complexes, and their characterization by various apectorizes of inorganic evidence in some situation and organometallic compounds, mechanisms of reactions, and magnetic and spectry properties of inorganic systems including examples in bioinorganic exhibits, especially those related to structure and appropriate conclusions relating to the essential and more advanced foundation knowledge of inorganic chemistry. Show advisity analyze problems to most famil	Offer in 2020 - 2021	Y 1st	t sem Offer in 2021 - 20)22 : Y	Examination	Dec	
B Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles, and theories relative to the more advanced foundation knowledge of inorganic characteristic confounds; mechanisms of reactions; and magnetic and spectral properties inorganic systems including examples in bioinorganic systems. Show evidence to apply and integrate knowledge and theorie claims to the more advanced foundation knowledge of inorganic chemistry. Show evidence to analyze novel problems are correct use of data and experimental results to draw appropriate conclusions relating to the essential and more advanced foundation knowledge of inorganic chemistry. Demonstrate effective laboratory skills and techniques, especially spectroscopic methods. C Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, are theories relating to the more advanced foundation knowledge of inorganic chemistry, specially those related to structure are bonding of inorganic experiments, and incomplete command of knowledge and understanding of essential facts, concepts, principles, are theories relating to the more advanced foundation knowledge of inorganic chemistry. Show ability analyze problems to most familiar situations and mostly correct but reconstructive and such appropriate conclusions relating to the essential and more advanced foundation knowledge of inorganic chemistry. Show ability analyze problems to most familiar situations and mostly correct but reconstructive and bonding compounds and metal complexes, and theric theories and techniques, septically in the synthesis and reactivity study of inorganic commonstructive practial but limited command of knowledge and understanding in the synthesis and reactivity study of inorganic confoundation and programmental compounds; mechanisms of reactions; and magnetic and spectral properties inorganic systems. Shore and techniques, specially in the synthesis and reactivity study of inorganic chemistry. Show limited a	-	A	Demonstrate thorough knowledge and understanding of essential facts, concepts, principles, and theories relating to the mor advanced foundation knowledge of inorganic chemistry, especially those related to structure and bonding of inorganic coordination and organometallic compounds; mechanisms of reactions; and magnetic and spectral properties of inorgani systems including examples in bioinorganic systems. Show strong ability to apply and integrate knowledge and theory relating the more advanced foundation knowledge of inorganic chemistry. Show strong ability to analyze novel problems and critical us of data and experimental results to draw appropriate and insightful conclusions relating to the essential and more advance foundation principles and knowledge of inorganic chemistry. Demonstrate highly effective laboratory skills and techniques especially in the synthesis and reactivity study of inorganic compounds and metal complexes, and their characterization by				
C Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, are thereins relating to the more advanced foundation knowledge of inorganic cystems. Show evidence of some abilities to apply an integrate knowledge and theory relating to the more advanced foundation knowledge of inorganic systems. Show evidence of some abilities to apply an integrate knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show ability analyze problems to most familiar situations and mostly control but erroneous use of data and experimental results to dra appropriate conclusions relating to the essential and more advanced foundation knowledge of inorganic chemists. Demonstrate partial but limited command of knowledge and inderstanding of essential facts, concepts, principles, and theoric relating to the more advanced foundation knowledge of inorganic chemists. One constitution or advanced foundation knowledge of inorganic chemists, concepts, principles, and theoric relating to the more advanced foundation knowledge of inorganic chemistry. Show evidence of limited abilities to apply, and integrat knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show evidence of limited abilities to apply, and integrat knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show evidence of limited abilities to apply, and integrat knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry in advanced foundation principles and knowledge of inorganic chemistry. Fail Demonstrate partially effective laboratory skills and techniques, especially in the synthesis and reactivity study of inorganic compounds and metal complexes, and their characterization by various spectroscopic methods. Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the more adva		В	Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the more advanced foundation knowledge of inorganic chemistry, especially those related to structure and bonding of inorganic, coordination and organometallic compounds; mechanisms of reactions; and magnetic and spectral properties of inorganic systems including examples in bioinorganic systems. Show evidence to apply and integrate knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show evidence to analyze novel problems and correct use of data and experimental results to draw appropriate conclusions relating to the essential and more advanced foundation principles and knowledge of inorganic chemistry. Demonstrate effective laboratory skills and techniques, especially in the synthesis and reactivity study of inorganic compounds and metal complexes, and their characterization by various				
Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles, and theori relating to the more advanced foundation knowledge of inorganic chemistry, especially those related to structure and bonding inorganic systems including examples in bioinorganic systems. Show evidence of limited abilities to apply and integrat knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show limited ability is analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to dra appropriate conclusions relating to the essential and more advanced foundation principles and knowledge of inorganic chemistry. Demonstrate partially effective laboratory skills and techniques, especially in the synthesis and reactivity study of inorgan compounds and metal complexes, and their characterization by various spectroscopic methods. Fail Demonstrate little or no evidence of command for knowledge and understanding of essential facts, concepts, principles, and theories relating to the more advanced foundation knowledge of inorganic chemistry, especially those related to structure and bonding of inorganic, coordination and organometallic compounds; mechanisms of reactions; and magnetic and spectra properties of inorganic systems including examples in bioinorganic systems. Show little or no evidence of abilities to apply an integrate knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show little or no ability to analyze problems to most familiar situations and erroneous use of data and experimental results to draw approprial conclusions relating to the essential and more advanced foundation knowledge of inorganic chemistry. Show little or no evidence of abilities to apply an integrate knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show little or no evidence of abilities to apply and the properties of a showledge		С	Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the more advanced foundation knowledge of inorganic chemistry, especially those related to structure and bonding of inorganic, coordination and organometallic compounds; mechanisms of reactions; and magnetic and spectral properties of inorganic systems including examples in bioinorganic systems. Show evidence of some abilities to apply and integrate knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the essential and more advanced foundation principles and knowledge of inorganic chemistry. Demonstrate moderately effective laboratory skills and techniques, especially in the synthesis and reactivity study of inorganic compounds and metal complexes, and their characterization by various spectroscopic methods. Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the more advanced foundation knowledge of inorganic chemistry, especially those related to structure and bonding of inorganic, coordination and organometallic compounds; mechanisms of reactions; and magnetic and spectral properties of inorganic systems including examples in bioinorganic systems. Show evidence of limited abilities to apply and integrate knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show limited ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the essential and more advanced foundation principles and knowledge of inorganic chemistry. Demonstrate partially effective laboratory skills and techniques, especially in the synthesis and reacti				
Fail Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles, are theories relating to the more advanced foundation knowledge of inorganic chemistry, especially those related to structure are bonding of inorganic, coordination and organometallic compounds; mechanisms of reactions; and magnetic and spectra bonding of inorganic systems including examples in bioinorganic systems. Show little or no evidence of abilities to apply an ability to analyze problems to most familiar situations and erroneous use of data and experimental results to draw appropria conclusions relating to the essential and more advanced foundation knowledge of inorganic chemistry. Show little or no evidence of abilities to apply an ability to analyze problems to most familiar situations and erroneous use of data and experimental results to draw appropria conclusions relating to the essential and more advanced foundation principles and knowledge of inorganic chemistry. Show little or no evidence of abilities to apply an ability to analyze problems to most familiar situations and erroneous use of data and experimental results to draw appropria conclusions relating to the essential and more advanced foundation knowledge of inorganic chemistry. Show little or no evidence of abilities to apply an ability to analyze problems to most familiar situations and experimental results to draw appropria conclusions relating to the essential and more advanced foundation knowledge of inorganic chemistry. Show little or no evidence of abilities to apply an ability of the essential and more advanced foundation knowledge of inorganic chemistry. Show little or no evidence of abilities to apply an ability of analyze problems to expensively and experimental results to draw appropria conclusions relating to the more advanced foundation knowledge of inorganic chemistry. Show little or no evidence of abilities to apply an ability of analyze problems to expensively and the expensively show and experimenta		D					
Course Teaching & Learning Activities Activities Details No. of Hours & Learning Activities 24 Laboratory 24 Tutorials 6 Reading / Self study 100 Assessment Methods and Weighting Methods Details Weighting in final course grade (%) Assessment Methods to CLO Mappin		Fail Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles, are theories relating to the more advanced foundation knowledge of inorganic chemistry, especially those related to structure an bonding of inorganic, coordination and organometallic compounds; mechanisms of reactions; and magnetic and spectroproperties of inorganic systems including examples in bioinorganic systems. Show little or no evidence of abilities to apply an integrate knowledge and theory relating to the more advanced foundation knowledge of inorganic chemistry. Show little or no ability to analyze problems to most familiar situations and erroneous use of data and experimental results to draw approprial conclusions relating to the essential and more advanced foundation principles and knowledge of inorganic chemistry. Demonstrate minimally effective laboratory skills and techniques, especially in the synthesis and reactivity study of inorganic					
& Learning Activities Lectures Laboratory Tutorials Reading / Self study Assessment Methods and Weighting Methods Details Weighting in final course grade (%) Methods to CLO Mappin		Lecture v	vith laboratory component	t course			
Laboratory Tutorials Reading / Self study Assessment Methods and Weighting Details Weighting in final course grade (%) Methods to CLO Mappin				Details			
Tutorials 6 Reading / Self study 100 Assessment Methods and Weighting Methods Assessment Methods course grade (%) Methods CLO Mappin	& Learning Activities						
Reading / Self study Assessment Methods and Weighting Methods Details Weighting in final course grade (%) Methods to CLO Mappin		-					
Assessment Methods and Weighting Methods Details Weighting in final course grade (%) Methods to CLO Mappin							
and Weighting course grade (%) Methods to CLO Mappin	Assassment Methods		· ·	Dotaile	Weighting in final		
Assignments 18 CLO 1,2,3,4				Detdiis	course grade (%)	Methods to CLO Mapping	
Examination 50 CLO 1,2,3,4							

	Laboratory reports		12	CLO 1,2,3,4		
	Test		20	CLO 1,2,3,4		
Required/recommended reading and online materials	Shriver & Atkins, Inorganic Chemis Catherine, Housecroft & Sharpe, Ir					
Additional Course	Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports to pass this					
Information	course.					

CHEM3342	Bioinoro	ganic chemistry	(6 credits)	Academic Ye	ar 2020		
Offering Department	Chemistry		(o orounto)	Quota	50		
Course Co-ordinator		Sun, Chemistry <i>(hsu</i>	n @hku.hk)		1		
Teachers Involved	(Dr H Y A	u Yeung,Chemistry)					
Course Objectives		Sun,Chemistry)	irom Pasia Ingrania Chemistry and	Pagia Organia Chamietry aivi	ing further and may		
Course Objectives	details of	inorganic chemistry	rom Basic Inorganic Chemistry and in biological system, with example f those intending to extend their stud	s relevance to biological prod	cesses and medica		
Course Contents Topics	behind the mechanisi	e requirement of bio ms by which organi	ected topics of interest. Examples in logical cells for metals such as zinc, sms obtain required metal ions fror	iron and copper; and metals	in medicine such a		
'auraa Laarnina		ds in treating diseas		to:			
ourse Learning outcomes	CLO 1 ur	nderstand the princi	his course, students should be able bles and concepts of inorganic/organ bonding, and spectral properties of	nic chemistry in biological syst			
			mechanisms of selected metal home f metal complexes medicine	eostasis (i.e. uptake, transpor	t and storage)		
re-requisites	Pass in Cl		i metal complexes medicine				
and Co-requisites nd Impermissible ombinations)	1 433 111 01	11EW2041					
offer in 2020 - 2021	Y 2nd	sem Offer in 202		Examination	May		
Grade Descriptors (A+ to F)	A	foundation knowledge bonding of metals in relevance to metal hor the basic foundation k and experimental resu bioinorganic chemistry and overall metallo-bio		elated to hard-soft acid-base theory; etic aspects of metal ions in biologi ability to apply and integrate knowled rong ability to analyze novel problem clusions relating to the basic princi ues, especially in the characterization	chelation; structure ar cal processes and the ge and theory relating is s and critical use of da ples and knowledge on on of inorganic active sil		
	В	B Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of bioinorganic chemistry, especially those related to hard-soft acid-base theory; chelation; structure and bonding of metals in biological systems; thermodynamic and kinetic aspects of metal ions in biological processes and their relevance to metal homeostasis; metal-based drugs. Show evidence to apply and integrate knowledge and theory relating to the basic foundation knowledge of bioinorganic chemistry. Show evidence to analyze novel problems and correct use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of bioinorganic chemistry. Demonstrate effective basic techniques, especially in the characterization of inorganic active site and overall metallic biomolecules.					
	С	Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of bioinorganic chemistry, especially those related to hard-soft acid-base theory; chelation; structure and bonding of metals in biological systems; thermodynamic and kinetic aspects of metal ions in biological processes and their relevance to metal homeostasis; metal-based drugs. Show evidence of some abilities to apply an integrate knowledge and theory relating to the basic foundation knowledge of bioinorganic chemistry. Show ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropriate conclusions relating to the basic principles and knowledge of bioinorganic chemistry. Demonstrate moderately effective basic techniques, especially in the characterization of inorganic active site and overall metallo-biomolecules.					
	D	Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles, and theoric relating to the basic foundation knowledge of bioinorganic chemistry, especially those related to hard-soft acid-base theoric chelation; structure and bonding of metals in biological systems; thermodynamic and kinetic aspects of metal ions in biologic processes and their relevance to metal homeostasis; metal-based drugs. Show evidence of limited abilities to apply and integrate knowledge and theory relating to the basic foundation knowledge of bioinorganic chemistry. Show limited ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropria conclusions relating to the basic principles and knowledge of bioinorganic chemistry. Demonstrate partially effective basic					
	Fail	Demonstrate little or r theories relating to the theory; chelation; struc biological processes and and integrate knowled to analyze problems conclusions relating to	in the characterization of inorganic active site to evidence of command of knowledge and to basic foundation knowledge of bioinorganiture and bonding of metals in biological synd their relevance to metal homeostasis; met ge and theory relating to the basic foundation to most familiar situations and erroneous the basic principles and knowledge of bic in the characterization of inorganic active site	understanding of essential facts, c c chemistry, especially those relater stems; thermodynamic and kinetic a al-based drugs. Show little or no evic knowledge of bioinorganic chemistry use of data and experimental resu inorganic chemistry. Demonstrate n	d to hard-soft acid-bases aspects of metal ions lence of abilities to app /. Show little or no abilits to draw appropriat		
ourse Type	Lecture-ba	ased course	ŭ				
ourse Teaching	Activities	3	Details		No. of Hours		
Learning Activities	Lectures		including literature aureus 9	recentation	36		
	Tutorials Reading /	/ Self study	including literature survey & pr	esentation	12 100		
ssessment Methods nd Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mappin		
	Assignme	ents		of 25	CLO 1,2,3,4		
	Examinat		assignments and presentation	75	CLO 1,2,3,4		
Paguirad/racammandad	-		Principles of Riginarganic Chemistra				
Required/recommended eading and online materials	Bertini, I.; Reactivity Metals and	Gray, H. B.; Stie , University Science d Life, Moore C., RS	Principles of Bioinorganic Chemistry fel, E. I.; Valentine, J. S., editors. Books, 2007 6C Publishing, 2010. Janic Elements in the Chemistry of	Biological Inorganic Chemi	stry: Structure an		

CHEM3441	Organic	chemistry II (6 cred	dits)	Academic Ye	ar 2020			
Offering Department	Chemistry	,	<u> </u>	Quota	300			
Course Co-ordinator	Dr X Y Li	(1st sem); Prof D Yang	(2nd sem), Chemistry (xiaoyuli@hk	ru.hk; yangdan @hku.hk)				
Teachers Involved		hemistry) ,Chemistry) ang,Chemistry)						
Course Objectives	As a cont chemistry	As a continuation from CHEM2441 Organic Chemistry I, this course aims to provide a solid foundation of organic chemistry together with CHEM2441. It focuses primarily on the basic principles to understand the structure and eactivity of organic molecules, with examples illustrating the role of organic chemistry in daily life and industry.						
Course Contents & Topics	amines; a	Chemistry of common organic functional groups: ketones and aldehydes; carboxylic acids and their derivatives amines; aromatic compounds. Principles of organic synthesis. Detailed considerations of reaction mechanisms Spectroscopic tools (UV-Vis, IR, NMR, and MS) for characterization and identification of organic compounds.						
Course Learning	On succe	ssful completion of this	course, students should be able to:					
Outcomes	CLO 1 dr	aw correct structural rep	presentations of organic molecules					
			ciples of structure and reactivity of o	•				
			ganic compounds based on spectro	•				
	cc		isms for transformations of common ketones, carboxylic acids, acyl hali					
	CLO 5 ap	preciate the importance	e of organic chemistry in daily life					
	CLO 6 de	evise synthetic pathways	s to organic compounds using funct	ional group chemistry				
Pre-requisites (and Co-requisites and Impermissible combinations)	[Remarks students	who admitted in 2014-	n changed to lecture-based cours 15 or before, they must enroll als o meet the Chemistry Major requirer	o CHEM3443 for enrollin				
Offer in 2020 - 2021		sem 2nd sem Offer		Examination	Dec May			
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations.							
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations.							
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems.							
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems							
Course Type	Lecture-h	ased course	intes, logical and conferent trilliking. Show ve	if y little of 110 ability to apply know	neage to solve problems.			
Course Teaching	Activities		Details		No. of Hours			
& Learning Activities	Lectures	•	Details		36			
a zoarmig / totivitioo	Tutorials				12			
	Reading / Self study				100			
Assessment Methods	Methods	•	Details	Weighting in final	Assessment			
and Weighting	Wethods		Details	Weighting in final course grade (%)	Methods to CLO Mapping			
	Assignme	ents		10	CLO 1,2,3,4,5,6			
	Examinat	ion	1 x 3 hr written examination	70	CLO 1,2,3,4,5,6			
	Test			20	CLO 1,2,3,4,5,6			
Required/recommended reading and online materials		Chemistry", by Paul v. Chapters 14-20.	a Y. Bruice, 2016, 8th Edition	on, Pearson, with e-tex	t and Mastering			

CHEM3442	Organic	chemistr	y of biomole	ecules (6 c	redits)		Academic Year	2020
Offering Department	Chemistry	У			•		Quota	50
Course Co-ordinator	Dr P H To	by, Chemistr	y (phtoy@hku.	hk)				
Teachers Involved	\ \	oy,Chemistr _i,Chemistry	,					
Course Objectives			f this course is nd biochemistr		students an u	nderstanding and	d appreciation of the	he role of organic
Course Contents & Topics						tes, amino acids pitors will also be	, peptides, coenzy presented.	mes, nucleotides
Course Learning	On succes	ssful comple	tion of this cou	urse, students	s should be ab	le to:		
Outcomes	CLO 1	have a basic	understandin	g of biologica	ally important of	rganic molecule:	S	
	CLO 2 have a basic understanding of enzyme catalysis							
	CLO 3 appreciate how organic chemistry plays an important role in biology and biochemistry							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Ch	CHEM2442 o	r CHEM3441					
Offer in 2020 - 2021	Y 1st	t sem Offer	in 2021 - 202	2 : Y			Examination	Dec
Grade Descriptors (A+ to F)	A	A Demonstrate thorough mastery at an advanced level of extensive biomolecule organic chemistry knowledge, and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence configural thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar problems. Apply highly effective organizational and presentational skills.				king, with evidence of		
	В	Demonstrate attaining at I	substantial commeast most of the co	nand of biomole ourse learning o	cule organic che utcomes. Show e	idence of analytical	range of knowledge, a and critical abilities and rganizational and pres	d logical thinking, and
	C Demonstrate general but incomplete command of biomolecule organic chemistry knowledge, and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to							

		apply knowledge to most familiar problems. Apply moderately effective organizational and presentational skills.				
	D Demonstrate partial but limited command of biomolecule organic chemistry knowledge, and skills require the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effect presentational skills.				ed analytical and critical	
	Fail	course learning outcome	s. Lack of analytical and critical ab	le organic chemistry knowledge, and skills ilities, logical and coherent thinking. Show ntational skills are minimally effective or inet	very little or no ability to	
Course Type	Lecture-	based course				
Course Teaching	Activities		Details	No. of Hours		
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	g / Self study			100	
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examination			60	CLO 1,2,3	
	Presentation			10	CLO 1,2,3	
	Test		2-mid term tests	30	CLO 1,2,3	
Required/recommended reading and online materials	Bruice, F	P.Y.; Organic Chemistry	/ (Pearson, 2017, 8th edition)), Chapters 20-26.		

CHEM3443	Organi	c chemistry labo	ratory (6 credits)	Academic Yea	r 2020		
Offering Department	Chemistr	-		Quota	80		
Course Co-ordinator	Dr A M Y	Yuen, Chemistry (r	maiyan @hku.hk)				
Teachers Involved	,	Y Yuen, Chemistry)					
0		Nang,Chemistry)					
Course Objectives	and the chemistry multistep	To provide students with intensive hands-on training of experimental chemistry techniques on organic rand the opportunity to develop analytical and critical thinking skills through scientific investigations in chemistry experiments. The course focuses on the practical aspects of a variety of organic reactions, inclumultistep syntheses. Chromatographic, instrumental, and spectroscopic techniques are also discussed holistic training of experimental organic chemistry.					
Course Contents				laboratory safety pra	ctice: preparation		
& Topics	purification	The course will include the following laboratory skills and practices: laboratory safety practice; prepara purification, and characterization of organic compounds; gas and liquid chromatography; ultraviolet-vi spectrophotometry; infrared spectroscopy; NMR spectroscopy and melting point determination					
Course Learning	On succe	essful completion of	this course, students should be able to:				
Outcomes	L	usage of chemicals	practice of laboratory safety and exercise		safe handling and		
			analyze the results of chemical experiment				
		apply modern instrur he results	mentation techniques to characterize organi	c compounds and drav	v conclusions from		
			ults of their work to others				
			n-solving skills, critical thinking and analytica	l reasoning			
Pre-requisites			s in CHEM3441, or already enrolled in this				
and Co-requisites and Impermissible combinations)	NOT for (for stude Pass in	NOT for students who have passed CHEM3441A in semester 1, 2015-16, or CHEM3441 in or bei (for students admitted in 2014-15 or before) Pass in CHEM2441 or CHEM2442 or CHEM2443; and Pass in CHEM3441 or CHEM3442, or alre					
Office in 2020 2024		any of these two courses (for students admitted in 2015-16 or thereafter)					
Offer in 2020 - 2021 Grade Descriptors	A	Y 1st sem 2nd sem Offer in 2021 - 2022 : Y Examination Dec Ma A Demonstrate extensive knowledge and thorough command of concepts and principles which are required for attaining					
(A+ to F)	В	wide range of comp techniques. Critically presentational skills. Demonstrate substan learning outcomes. S critical abilities and lo skills and techniques	omes. Show strong analytical and critical abilities and olex, familiar and unfamiliar situations. Competently appraise data to draw appropriate and insightful con- tial command of a broad range of knowledge and ski Show substantial grasp and mastery of the subject k gigal thinking, and ability to apply knowledge to familia and critical analysis of experimental data. Apply effecting the control of the c	conduct experiment with a clusions. Apply highly effectills required for attaining at least nowledge. Demonstrate evice ar and some unfamiliar situative organizational and present	efficient lab skills an tive organizational an east most of the cours lence of analytical an ons. Show effective lational skills.		
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show general but incomplete grasp of the subject knowledge. Demonstrate evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Show moderately effective lab skills and techniques. Demonstrated some ability to analyze experimental data critically. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills required for attaining course learning outcomes. Ability to recall						
	Demonstrate partial but limited command of knowledge and skills required for attaining course learning outcomes. Ability to recall some of factual information of the subject. Show a partial comprehension of basic concepts and principles and weak ability to apply them. Demonstrate evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Demonstrate partially effective lab skills and techniques. Apply limited or barely effective organizational and presentational skills.						
	Fail	Demonstrate little or n evidence of little or n and coherent thinking	no evidence of command of knowledge and skills requi o grasp of the knowledge and understanding of the si o, Show very little or no ability to apply knowledge to nd techniques. Organization and presentational skills a	red for attaining the course le ubject. Lack of analytical and solve problems. Demonstrat	arning outcomes. Sho critical abilities, logic minimally effective		
Course Type	Lecture v	with laboratory comp	onent course				
Course Teaching	Activitie	es	Details	No. of H			
Learning Activities	Laborato		12 x 4-hr lab sessions				
	Tutorials				12		
		/ Self study			100		
Assessment Methods and Weighting	Method	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examina	ation	(20% practical exam and 30% 2-hr written exam)	50	CLO 1,2,3,4,5		
	Laborato	ory reports	(Include Lab Quiz 15%, Lab Report and Notebook 25% and	50	CLO 1,2,3,4,5		

	Lab Performance 10%)
Required/recommended	John W. Lehman: Operational Organic Chemistry - A Problem-Solving Approach to the Laboratory Course
reading and	(Pearson, latest edition)
online materials	
Additional Course	Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports to pass this
Information	course.

Dr A M Y Dr J He,C This cours organomel vacuum a separation extraction orm an im s also incl The cours synthesis nstrument Dn succes CLO 1 De CLO 2 De CLO 3 Ap the CLO 4 An CLO 5 De	Yuen, Chemistry (mail Yuen, Chemistry) Chemistry) Se aims to provide stallic chemistry. This and inert atmosphere in of mixtures and isol techniques. Experim inportant part of the colluded. Se will include the foll planning, experimentation techniques. Essful completion of this emonstrate a good plange of chemicals emonstrate proficience oply modern instrume in eresults analyze the influence of emonstrate problems. HEM3443 or already The offer in 2021 Demonstrate extensive course learning outcome wide range of complex techniques. Critically appresentational skills. Demonstrate substantial learning outcomes. Sho	students with experience using technic is advanced synthesis course covering a retechniques to prepare organic and lation of products by use of column and thents on characterization and identification ourse. The use of the chemical literature is lowing laboratory skills and practices: lating later up, purification, and characterization is course, students should be able to: practice of laboratory safety and exercise and its in the product of the produc	a variety of synthetic norganometallic compounthin-layer chromatograph on by chemical and specin molecular design and boratory safety practice; ation of organic compounts are proper procedures for question of organic and draw chemical properties of organic reasoning Examination Examination Examination Examination I logical thinking, with ability to y conduct experiment with e proclusions. Apply highly effect	methods, including nds; methods for nds; methods for ny, sublimation and throscopic methods synthesis planning molecular design nds using modern safe handling and viconclusions from a conclusions from a conclusion from the new papely knowledge to a sufficient lab skills and tive organizational and
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ecture wi		· · · · · · · · · · · · · · · · · · ·	are minimizing encourse or meno	
Activities	•	Details		No. of Hours
	гу			48
Tutorials				12
	•			100
Methods			Weighting in final course grade (%)	Assessment Methods to CLO Mappin
Laborator	ry reports	(Practical Examination 25%; Lab report 10%; Lab performance 10%)	45	CLO 1,2,3,4,5
	tion		20	CLO 3,4,5
Test				CLO 1,2,3,4,5
		al Organic Chemistry - A Problem-Solv	ving Approach to the L	aporatory Course
	y classes are manda	tory. Students must complete ALL exper	riments and laboratory r	eports to pass thi
	ecture w Activities Laborator Futorials Reading Methods Laborator Presenta Fest Ohn W. Pearson,	apply them. Demonstrate Demonstrate partially effail Demonstrate partially effail Demonstrate little or no evidence of little or no evidence of little or no end coherent thinking. In effective lab skills and ecture with laboratory composition. Activities Laboratory Laboratory Laboratory Laboratory reports Presentation Lest Lehman: Operations Pearson, latest edition)	apply them. Demonstrate evidence of some coherent and logical think Demonstrate partially effective lab skills and techniques. Apply limited or be evidence of little or no evidence of command of knowledge and skills requevidence of little or no grasp of the knowledge and understanding of the sand coherent thinking. Show very little or no ability to apply knowledge to ineffective lab skills and techniques. Organization and presentational skills requestive with laboratory component course Activities aboratory Futorials Reading / Self study Methods Details (Practical Examination 25%; Lab report 10%; Lab performance 10%) Presentation Fest Test/ Quiz ohn W. Lehman: Operational Organic Chemistry - A Problem-Solv Pearson, latest edition) aboratory classes are mandatory. Students must complete ALL expe	apply them. Demonstrate evidence of some coherent and logical thinking, but with limited analytical Demonstrate partially effective lab skills and techniques. Apply limited or barely effective organizational ar Demonstrate little or no evidence of command of knowledge and skills required for attaining the course le evidence of little or no grasp of the knowledge and understanding of the subject. Lack of analytical and and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Demonstrate ineffective lab skills and techniques. Organization and presentational skills are minimally effective or ineffected with laboratory component course Activities Details Details Weighting in final course grade (%) Weighting in final course grade (%) Presentation (Practical Examination 25%; Lab report 10%; Lab performance 10%) Presentation Test/ Quiz 35 Ohn W. Lehman: Operational Organic Chemistry - A Problem-Solving Approach to the L

CHEM3541	Physical chemistry: Introduction to quantum chemistry (6 credits) Academic Year			
Offering Department	Chemistry	Quota	100	
Course Co-ordinator	Prof G H Chen, Chemistry (ghc@yangtze.hku.hk)			
Teachers Involved	(Dr C Y Yam, Chemistry)			
Course Objectives	The course presents fundamental principles and topics on quantum chemis	stry in order to p	provide a soiled	

Cource Contante			to further their studies in chemist			
Course Contents & Topics	mechanic particle in structure	lementary quantum mechanics: Historical development, Postulates of quantum mechanics, Principles of quantum to a function of angular momentum, Heisenberg uncertainty principle. Applications to simple systematicle in a box, harmonic oscillator, rigid rotator; Atomic structure: Hydrogen and many electron atoms. Mostructure and chemical bonds. Approximation methods: variational method, Hartree-Fock method, valence neory, and perturbation theory.				
Course Learning		successful completion of this course, students should be able to:				
Outcomes	CLO 1 u	· · · · · · · · · · · · · · · · · · ·	terminology and nomenclature in		cs discussed in the	
	n	nolecular structure	and understanding of basic of	' '		
	n	nolecular systems	numerical procedures and the b		ım mechanics and	
		•	ne application of Hartree-Fock me	ethod to molecules		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in (CHEM2541				
Offer in 2020 - 2021	Y 1s	t sem Offer in 2021 - 2	022 : Y	Examination	Dec	
Grade Descriptors (A+ to F)	learning outcomes. Show to apply knowledge to a		stery at an advanced level of extensive strong analytical and critical abilities and lo de range of complex, familiar and unfamili ults to draw appropriate and insightful cor	ogical thinking, with thorough grasp o liar situations. Apply highly effective l nclusions.	of the subject, and ability ab skills and techniques	
	В	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and substantial grasp of the subject, ability to apply knowledge to familiar and some unfamiliar situations. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.				
	С	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and general but incomplete grasp of the subject, ability to apply knowledge to most familiar situations. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
		D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show partial but limited grasp of the subject, retention of some relevant information of the subject, ability to apply knowledge to solve problems. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.				
	D	Show evidence of some cograsp of the subject, retent	oherent and logical thinking, but with limition of some relevant information of the	nited analytical and critical abilities. subject, ability to apply knowledge to	Show partial but limited o solve problems. Apply	
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Course Type	Fail	Show evidence of some or grasp of the subject, retent partially effective lab skills a Demonstrate little or no evi of analytical and critical abi subject, very little or no a	oherent and logical thinking, but with lim tion of some relevant information of the sand techniques. Limited ability to use data dence of command of knowledge and sk littes, logical and coherent thinking. Show bility to apply knowledge to solve probl and results and/or unable to draw approp	nited analytical and critical abilities. subject, ability to apply knowledge to an dresults to draw appropriate con iills required for attaining the course by little or no grasp of the knowledge lems. Apply minimally effective or in	Show partial but limited o solve problems. Apply aclusions. learning outcomes. Lack and understanding of the	
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Course Teaching & Learning Activities Assessment Methods	Fail Lecture v Activitie Lectures Laborato Tutorials Reading	Show evidence of some or grasp of the subject, retenil partially effective lab skills a Demonstrate little or no evi of analytical and critical abi subject, very little or no at techniques. Misuse of data with laboratory componer es	oherent and logical thinking, but with lim tion of some relevant information of the and techniques. Limited ability to use data dence of command of knowledge and sk lities, logical and coherent thinking. Show bility to apply knowledge to solve problem and results and/or unable to draw approprict course Details	nited analytical and critical abilities. subject, ability to apply knowledge it a and results to draw appropriate concills required for attaining the course iv little or no grasp of the knowledge alems. Apply minimally effective or inpriate conclusions. Weighting in final	Show partial but limited o solve problems. Apply inclusions. Idearning outcomes. Lack and understanding of the neffective lab skills and the solution of the neffective lab skills and the solution of the sol	
Course Teaching & Learning Activities Assessment Methods	Fail Lecture v Activitie Lectures Laborate Tutorials Reading Methods Examina Laborate	Show evidence of some or grasp of the subject, retenil partially effective lab skills a Demonstrate little or no evi of analytical and critical abi subject, very little or no at techniques. Misuse of data with laboratory componer es	oherent and logical thinking, but with lim tion of some relevant information of the and techniques. Limited ability to use data dence of command of knowledge and sk littes, logical and coherent thinking. Show bility to apply knowledge to solve probl and results and/or unable to draw appropriat course Details Details Experiment & Lab report	nited analytical and critical abilities. subject, ability to apply knowledge training and results to draw appropriate concills required for attaining the course to little or no grasp of the knowledge alems. Apply minimally effective or in priate conclusions. Weighting in final course grade (%)	Show partial but limited o solve problems. Apply inclusions. Idearning outcomes. Lack and understanding of the neffective lab skills and School of Hours 24 24 6 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3,4	
Course Teaching & Learning Activities Assessment Methods and Weighting	Fail Lecture v Activitie Lectures Laborate Tutorials Reading Methods Examina Laborate Test	Show evidence of some or grasp of the subject, retent partially effective lab skills a Demonstrate little or no evi of analytical and critical abi subject, very little or no a techniques. Misuse of data with laboratory componer as a subject, very little or no a techniques. Misuse of data with laboratory componer as a subject, very little or no a techniques. Misuse of data with laboratory componer as a subject, very little or no analysis of the subject	oherent and logical thinking, but with lim tion of some relevant information of thes and techniques. Limited ability to use data dence of command of knowledge and sk littes, logical and coherent thinking. Show bility to apply knowledge to solve probl and results and/or unable to draw appropent course Details Details Experiment & Lab report Test/Quiz	nited analytical and critical abilities. subject, ability to apply knowledge the and results to draw appropriate concills required for attaining the course wittle or no grasp of the knowledge alems. Apply minimally effective or in priate conclusions. Weighting in final course grade (%)	Show partial but limited of solve problems. Apply inclusions. Idearning outcomes. Lack and understanding of the neffective lab skills and the solve of the solve	
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended	Fail Lecture v Activitie Lectures Laborate Tutorials Reading Methods Examina Laborate Test D. A. Mc	Show evidence of some or grasp of the subject, retent partially effective lab skills a Demonstrate little or no evi of analytical and critical abi subject, very little or no a techniques. Misuse of data with laboratory componer as a subject, very little or no a techniques. Misuse of data with laboratory componer as a subject, very little or no a techniques. Misuse of data with laboratory componer as a subject, very little or no analysis of the subject	oherent and logical thinking, but with lim tion of some relevant information of thes and techniques. Limited ability to use data dence of command of knowledge and sk littes, logical and coherent thinking. Show bility to apply knowledge to solve probl and results and/or unable to draw appropent course Details Details Experiment & Lab report Test/Quiz iistry (2nd Edition, 2007)	nited analytical and critical abilities. subject, ability to apply knowledge training and results to draw appropriate concills required for attaining the course to little or no grasp of the knowledge alems. Apply minimally effective or in priate conclusions. Weighting in final course grade (%)	Show partial but limited o solve problems. Apply inclusions. Idearning outcomes. Lack and understanding of the neffective lab skills and School of Hours 24 24 6 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3,4	
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Fail Lecture v Activitie Lectures Laborato Tutorials Reading Methods Examina Laborato Test D. A. Mc I. N. Levi	Show evidence of some or grasp of the subject, retent partially effective lab skills a Demonstrate little or no evi of analytical and critical abisubject, very little or no a techniques. Misuse of data with laboratory componer as Sory Soly / Self study Soly Soly Soly Soly Soly Soly Soly Sol	oherent and logical thinking, but with limition of some relevant information of the and techniques. Limited ability to use data dence of command of knowledge and skilities, logical and coherent thinking. Show bility to apply knowledge to solve problem of the analysis and/or unable to draw appropriate course Details Details Experiment & Lab report Test/Quiz instry (2nd Edition, 2007) 5th Edition, 2008)	weighting in final course grade (%) Weighting in final course grade (%) Weighting in final course grade (%) 70 20 10	Show partial but limited o solve problems. Apply inclusions. Idearning outcomes. Lack and understanding of the neffective lab skills and No. of Hours 24 24 6 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3,4 CLO 1,2,3	
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Fail Lecture v Activitie Lectures Laborato Tutorials Reading Methods Examina Laborato Test D. A. Mc I. N. Levi	Show evidence of some or grasp of the subject, retent partially effective lab skills a Demonstrate little or no evi of analytical and critical abisubject, very little or no a techniques. Misuse of data with laboratory componer as Sory Soly / Self study Soly Soly Soly Soly Soly Soly Soly Sol	oherent and logical thinking, but with lim tion of some relevant information of thes and techniques. Limited ability to use data dence of command of knowledge and sk littes, logical and coherent thinking. Show bility to apply knowledge to solve probl and results and/or unable to draw appropent course Details Details Experiment & Lab report Test/Quiz iistry (2nd Edition, 2007)	weighting in final course grade (%) Weighting in final course grade (%) Weighting in final course grade (%) 70 20 10	Show partial but limited o solve problems. Apply inclusions. Idearning outcomes. Lack and understanding of the neffective lab skills and the standard standa	

CHEM3542	Physical chemistry: statistical thermodynamics and kinetics theory (6 credits) Academic Yea					
Offering Department	Chemistry	Quota	50			
Course Co-ordinator	Dr. J Yang, Chemistry (juny@hku.hk)					
Teachers Involved	(Dr J Yang,Chemistry)					
Course Objectives	The course presents fundamental principles and topics on statistical thermod provide a solid foundation for students intending to further their studies in physical provides a solid foundation for students intending to further their studies in physical provides a solid foundation for students intending to further their studies in physical provides a solid foundation for students.					
Course Contents & Topics	Principles of Statistical Thermodynamics - Thermodynamic laws - Ensembles and partition functions: microcanonical, canonical and grand-can - Systems of independent molecules: ideal gas - Molecular degrees of freedom: translation, rotation, vibration, and electronic - Ideal gas mixture: chemical equilibrium, binding, and titration - Quantum statistics Chemical equilibrium and kinetics theory - Rate theory: collision theory, transition state theory, electron transfer	onical				
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 understand and use the terminology and nomenclature in statistical thermodynamics and topics discussed in the course CLO 2 demonstrate knowledge and understanding of basic concepts in statistical thermodynamics CLO 3 understand correlation between macroscopic observables and microscopic statistical model systems					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in CHEM2541		·			

Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	2022 : Y	Exam	nination	May
Grade Descriptors (A+ to F)	Thorough mastery at an advanced level of extensive knowledge of statistical thermodynamics and reaction dynamics. Demonstrate evidence of strong analytical / critical abilities and logical thinking. Can apply the knowledge to practical questions in Physical Chemistry.					
	В	Substantial command of knowledge of statistical thermodynamics and reaction dynamics. Demonstrate evidence of analytical / critical abilities and logical thinking. Understand the scope of Physical Chemistry questions that can be applied with the knowledge.				
	С	General but incomplete cor analytical thinking. Can app		statistical thermodynamics and reaction d liar situations.	ynamics. Der	nonstrate evidence of
	D	Partial but limited command of knowledge of knowledge of statistical thermodynamics and reaction dynamics. Demonstrate limited evidence of analytical thinking. Understand the question to be solved with knowledge.				
	Fail	Little or no evidence of com	nmand of knowledge of st	atistical thermodynamics and reaction dyr	namics.	
Course Type	Lecture wi	th laboratory componer	nt course			
Course Teaching	Activities	•	Details			No. of Hours
& Learning Activities	Lectures					24
	Laboratory					24
	Tutorials					4
	Reading /	Self study				100
Assessment Methods and Weighting	Methods		Details	Weighting in course grad	le (%)	Assessment Methods to CLO Mapping
	Assignme	ents		50		CLO 1,2,3
	Examination			50		CLO 1,2,3
Required/recommended	P. Atkins,	Physical Chemistry (10	th edition)			
reading and online materials		olecular driving forces: An introduction to Statis		namics in biology, chemistry, phys cs	ics and na	noscicence
Course Website	Nil					
Additional Course Information	course.		•	omplete ALL experiments and lal	•	
		are strongly recommen ing this course.	ded to take CHEM3	3541 Physical Chemistry: Introduc	ction to Qu	antum Chemistry

CHEM3999	Directe	d studies in cher	nistry (6 credits)	Academic Yea	r 2020		
Offering Department	Chemist	ry	<u> </u>	Quota			
Course Co-ordinator	Prof D L	Phillips, Chemistry (ohillips @hku.hk)				
Teachers Involved	(Various	teachers in the Depa	artment,Chemistry)				
Course Objectives		This course is designed for third year students who would like to take an early experience on research. It offers students an opportunity to carry out small scale chemical projects by themselves.					
Course Contents & Topics	contents	Students interested in taking this course should contact their prospective supervisors in May to determine the contents and the nature of their project in the coming academic year. Prior approval from both the prospective supervisor and the course coordinator is required.					
Course Learning Outcomes	CLO 1 u	On successful completion of this course, students should be able to: CLO 1 understand the terminology and nomenclature associated with the small scale chemical pro- worked on in the course					
			ge and understanding of basic concepts				
			onships of the their particular chemical p	•	•		
Pre-requisites (and Co-requisites and Impermissible combinations)	or CHEMAN This cap This cou	Pass in at least 24 credits of advanced level disciplinary core/elective chemistry courses (CHEM3XXX CHEM4XXX) in the Chemistry Major including a pass in CHEM2341 or CHEM2441 or CHEM2442 or CHEM2 or CHEM3146. This capstone course is for Chemistry Major/ Chemistry Major (Intensive) students only. This course is designed for third year students who would like to take an early experience on research. The earliest that a student is allowed to take this capstone course is their year 3 study.					
Offer in 2020 - 2021		·					
Grade Descriptors (A+ to F)	A	originality. Illuminating sources. Critical emplo of a wide range of ap	mprehension of the subject. Demonstrate very al utilization and critical analysis / evaluation of i byment of data and results to synthesize appropria propriate theories, principles, data and methods. uld demonstrate substantial additional work beyor	nformation acquired from a wide ate and illuminating conclusions. I Employ very effective organization	e range of high qualit Demonstrate integration onal and presentation		
	В	information from sources. Demonstrate ability to compose meaningful comparisons between different secondary interpretations. Correct utilization of data and results to form appropriate conclusions. Compose general integration of theories, principles, data and methods. Perform effective organizational and presentational skills.					
	Show a general but incomplete comprehension of the subject. Presence of some analytical and critical thinking with use of relevant information from sources. Demonstrate ability to compose comparisons between different interpretations. Mainly correct but some incorrect utilization of data and results to form appropriate conclusions. Demonstrate some partial integration of theories, principles, data and methods. Perform moderately effective organizational and presentational skills.						
	Show a partial but limited comprehension, with knowledge of some relevant information, of the subject. Presence of some coherent and logical thinking, but with limited analytical and critical abilities. Show utilization and reference of several sources, but mostly via summary instead of by analysis and comparison. Limited ability to employ data and results to form appropriate conclusions. Demonstrate limited integration of theories, principles, data and methods. Perform limited or marginally effective organizational and presentational skills.						
Fail Show little or no comprehension of the subject. Evidence of little or lack of analytical and critiniking. Limited employment of secondary sources and no critical comparison of them. Incorrunable to form appropriate conclusions. Demonstrate little or no integration of theories Organization and presentational skills are of very limited use or ineffective.				parison of them. Incorrectly utilize ntegration of theories, principles	data and results and/o		
Course Type	Project-b	pased course					
Course Teaching	Activitie	es	Details	Details No. of Hou			
& Learning Activities	Reading	g / Self study	discussion & meetings to be arrar the supervisor	discussion & meetings to be arranged by the student and			
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods		
and weighting					to CLO Mapping		

reading and online materials	
Additional Course Information	Exceptional academic strength of the students is required for taking this course. The course may involve Laboratory component as Course Teaching & Learning Activities.

CHEM4142	Symme	try, group theory	and applications (6 credits)	Academic Yea		
Offering Department	Chemistry			Quota	60	
Course Co-ordinator		W Yam, Chemistry	(wwyam@hku.hk)			
Teachers Involved		Гоng,Chemistry) / W Yam,Chemistry)				
Course Objectives			f symmetry and group theory and to a	pply them in solving chemi	ical problems. This	
•		•	ntroductory treatment of bonding the	, 0		
		spectroscopy. This course is essential for students who wish to take advanced courses in inorganic chemistry and				
Course Contents		all types of spectroscopy. Symmetry elements and symmetry operations; symmetry point groups; reducible and irreducible representations;				
& Topics		character tables; direct products; symmetry-adapted linear combinations; projection operators; hybrid orbitals;				
•		molecular orbital theory for organic, inorganic and organometallic systems; selected applications in electronic and				
		vibrational spectroscopy.				
Course Learning Outcomes		•	this course, students should be able to: principles and concepts of symmetry a	and aroun theory and to an	nly them in solving	
		hemical problems	principles and concepts of symmetry t	and group theory and to ap	pry tricin in solving	
	CLO 2 de	emonstrate knowled	dge and understanding in the use o	of character tables and p	rojection operator	
		echniques				
			lge and understanding of bonding the organic and organometallic systems	ories involving hybrid orbi	tais and molecular	
			lge and understanding in the application	on of symmetry and group	theory in electronic	
		nd vibrational spectr	•	, 9 р	,	
Pre-requisites	Pass in C	CHEM3341				
(and Co-requisites						
and Impermissible combinations)						
Offer in 2020 - 2021	Y 1st	t sem Offer in 202	1 - 2022 : Y	Examination	Dec	
Grade Descriptors	Α	Demonstrate thorough	knowledge and understanding of essential fact	s, concepts, principles, and theori		
(A+ to F)			d their applications in solving chemical problen symmetry point groups; reducible and irreduce			
		symmetry-adapted lin	ear combinations; projection operators; treatm	nent of bonding theories including	ng hybrid orbitals and	
			organic, inorganic and orgametallic systems; an apply and integrate knowledge and theory relati			
			applications in bonding, and electronic and vibra- use of data and experimental results to draw appr			
		and applications of syr	mmetry and group theory.	<u> </u>		
	В		ial command of knowledge and understanding of			
		to symmetry and group theory and their applications in solving chemical problems, especially those related to symmetry elements and symmetry operations; symmetry point groups; reducible and irreducible representations; character tables; direct				
		products; symmetry-adapted linear combinations; projection operators; treatment of bonding theories including hybrid orbitals and molecular orbitals for organic, inorganic and orgametallic systems; and applications in electronic and vibrational spectroscopy. Show evidence to apply and integrate knowledge and theory relating to the basic principles and concepts of				
			theory and their applications in bonding, and elems and correct use of data and experimental			
		principles and applicat	tions of symmetry and group theory.			
	С		but incomplete command of knowledge and un mmetry and group theory and their applications			
		symmetry elements a	and symmetry operations; symmetry point group	ps; reducible and irreducible rep	resentations; characte	
		tables; direct products; symmetry-adapted linear combinations; projection operators; treatment of bonding theories including hybrid orbitals and molecular orbitals for organic, inorganic and orgametallic systems; and applications in electronic and				
		vibrational spectroscopy. Show evidence of some abilities to apply and integrate knowledge and theory relating to the basic principles and concepts of symmetry and group theory and their applications in bonding, and electronic and vibrational				
		spectroscopy. Show ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and				
	experimental results to draw appropriate conclusions relating to the principles and applications of symmetry and group theory. Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles, and theories					
	U	relating to symmetry a	and group theory and their applications in solving	chemical problems, especially the	ose related to symmetry	
			try operations; symmetry point groups; reducible			
		products; symmetry-adapted linear combinations; projection operators; treatment of bonding theories including hybrid orbitals and molecular orbitals for organic, inorganic and organetallic systems; and applications in electronic and vibrational				
		spectroscopy. Show evidence of limited abilities to apply and integrate knowledge and theory relating to the basic principles and concepts of symmetry and group theory and their applications in bonding, and electronic and vibrational spectroscopy. Show				
	limited ability to analyze problems to most familiar situations and mostly correct but erroneous use of data and experimental					
	results to draw appropriate conclusions relating to the principles and applications of symmetry and group theory. Fail Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles, and					
	theories relating to symmetry and group theory and their applications in solving chemical problems, especially those related to symmetry elements and symmetry operations; symmetry point groups; reducible and irreducible representations; character					
		tables; direct products; symmetry-adapted linear combinations; projection operators; treatment of bonding theories including hybrid orbitals and molecular orbitals for organic, inorganic and orgametallic systems; and applications in electronic and vibrational spectroscopy. Show little or no evidence of abilities to apply and integrate knowledge and theory relating to the basis principles and concepts of symmetry and group theory and their applications in bonding, and electronic and vibrational				
	spectroscopy. Show little or no ability to analyze problems to most familiar situations and erroneous use of data and experimental results to draw appropriate conclusions relating to the principles and applications of symmetry and group theory.					
Course Type	Lecture-h	experimental results to	o draw appropriate conclusions relating to the prin	ioipies and applications of symme	ay and group theory.	
	Activitie		Details		No. of Hours	
Course reaching	Lectures					
	Tutorials		or discussion		12	
	Reading / Self study					
& Learning Activities		·			100	
& Learning Activities Assessment Methods	Reading Methods	·	Details	Weighting in final	100 Assessment	
& Learning Activities Assessment Methods		·	Details	Weighting in final course grade (%)	100 Assessment Methods	
& Learning Activities Assessment Methods	Methods	5	Details	course grade (%)	100 Assessment Methods to CLO Mapping	
& Learning Activities Assessment Methods		ents	Details		Assessment Methods to CLO Mapping CLO 1,2,3,4	
Course Teaching & Learning Activities Assessment Methods and Weighting	Methods	ents	Details	course grade (%)	100 Assessment Methods to CLO Mapping	

reading and online materials	
Additional Course Information	This course is also offered to RPg students, and the course code for RPg students is CHEM6116.

CHEM4143	Interfac	ial science and tech	nology (6 credits)	Academic Ye	ar 2020			
Offering Department	Chemistry		, , , , , , , , , , , , , , , , , , ,	Quota	50			
Course Co-ordinator	Prof G K	Y Chan, Chemistry <i>(hrsc</i>	ccky@hku.hk)	·	'			
Teachers Involved	(Prof G K	Y Chan,Chemistry) Professor,Chemistry)	•					
Course Objectives	To under	To understand the science and technology of interfacial phenomena and processes often appeared in high value added products and modern technologies.						
Course Contents	Physics and Chemistry of Interfaces: coatings and surfactants, colloids and interfaces, wetting, microemulsion, thir							
R Topics	,	ind Chemistry of interfact iomaterials, porous mate	<u> </u>	, colloids and interfaces, wetting,	microemuision, in			
Course Learning		• •	course, students should be al	hle to:				
Outcomes		•	nomena and their origin from					
				gy by applying knowledge of	neneral chemistry			
		ermodynamics, and kine		gy by applying knowledge or	goriorai orioriiloti y			
				tion of interfacial science, include	ling nanomaterials			
			ncy, composite polymers, and		3			
Pre-requisites and Co-requisites and Impermissible combinations)	Pass in C	ass in CHEM3143 or CHEM3541 or CHEM3542						
Offer in 2020 - 2021	Y 2nd							
Grade Descriptors (A+ to F)	Y 2nd sem Offer in 2021 - 2022: N Examination May							
	B Demonstrate substantial knowledge of interfacial science and technology and command of skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to solve problems in familiar and some unfamiliar situations. Correct use of data and sourcing of references. Apply effective organizational and presentational skills.							
	C Demonstrate general but incomplete knowledge of interfacial science and technology and command of skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge solve problems to most familiar situations. Mostly correct but some erroneous use of data and references. Apply moderately effective organizational and presentational skills.							
	D Demonstrate partial but limited knowledge of interfacial science and technology and command of skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Limited ability to use data and source references. Apply limited or barely effective organizational and presentational skills.							
	Fail Demonstrate little or no evidence of knowledge of interfacial science and technology, and command of skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Misuse of data and references. Organization and presentational skills are minimally effective or ineffective.							
Course Type	Lecture-b	ased course						
Course Teaching	Activities	S	Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials		or discussion		12			
	Reading	/ Self study			100			
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments			15	CLO 1,2,3			
	Examination							
	Examinat	tion		50	CLO 1,2,3			
	Examinat Test	tion		35	CLO 1,2,3 CLO 1,2,3			
Required/recommended	Test		ence					
Required/recommended reading and online materials	Test		ence					

CHEM4144	Advanced materials (6 credits) Academic Year 2020					
Offering Department	Chemistry	Quota	30			
Course Co-ordinator	Dr E C M Tse, Chemistry (ecmtse@hku.hk)					
Teachers Involved	(Dr E C M Tse,Chemistry) (Dr K Okuro,Chemistry)					
Course Objectives	This course is a continuation from Introdution to Materials Chemistry. I on materials chemistry and application of materials in advanced tech materials chemistry will also be discussed.					
Course Contents & Topics	Advanced polymerization methods: copolymerization and applications of copolymers, coordination polymerization, control of stereochemistry in polymers; ionic and radical living polymerization. Materials for specialty applications: high strength materials; high temperature polymers, polyelectrolytes, conducting polymers, optical information storage, sensors, photonics, electronics, nanotechnology. Advanced materials characterization techniques.					
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 describe the mechanisms and kinetics of copolymerizations, coordination polymerizations, and living polymerizations					
	CLO 2 identify examples of some engineering polymers for high temperature/high strength applications, and how are their properties affected by the molecular structures					
	CLO 3 demonstrate knowledge in advanced materials characterization techniques					
	CLO 4 understand the working principles of materials for information sto	orage and opto-electronic	applications			
Pre-requisites	Pass in CHEM3143					

(and Co-requisites and Impermissible						
combinations) Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	022 · Y	Examination	Mav	
Grade Descriptors (A+ to F)	A	Demonstrate thorough know approach in polymer synthe ability to apply and integrate ability to analyze novel problem.	vledge and understanding of sis, properties, application, an knowledge and theory relating	essential facts, concepts, principles, and the d characterization of materials for advanced g to the synthesis and applications of advance and experimental results to draw appropriate	eories relating to frontier technology. Show strong and materials. Show strong	
	В	B Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles, and theories relating to frontier approach in polymer synthesis, properties, application, and characterization of materials for advanced technology. Show evidence to apply and integrate knowledge and theory relating to the synthesis and applications of advanced materials. Show evidence to analyze novel problems and correct use of data and experimental results to draw appropriate conclusions relating to advanced materials synthesis and their properties.				
	С					
	D					
	Fail	theories relating to frontier a technology. Show little or n applications of advanced ma	pproach in polymer synthesis, o evidence of abilities to app aterials. Show little or no ability	edge and understanding of essential facts, of properties, application, and characterization ly and integrate knowledge and theory relat v to analyze problems to most familiar situations relating to advanced materials synthesis	of materials for advanced ing to the synthesis and ons and erroneous use of	
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials		or discussion		12	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents		30	CLO 1,2,3,4	
	Examinat	ion		50	CLO 1,2,3,4	
	Test			20	CLO 1,2,3,4	
Required/recommended reading and online materials	Specialist	references will be given	throughout the course.	·	· · · · ·	

CHEM4145	Medicin	nal chemistry (6 credits)	Academic Year	2020		
Offering Department	Chemistry		Quota	40		
Course Co-ordinator	Dr Y Li, C	Chemistry (yingli0e @hku.hk)				
Teachers Involved	(Dr Y Li,C	(Dr X Li,Chemistry) (Dr Y Li,Chemistry) (Prof X C Li,Chemistry)				
Course Objectives	in areas	This course covers the chemical principles of drug design and drug action and uses as an introduction to research in areas of bioorganic chemistry, bioinorganic chemistry, medicinal chemistry, pharmaceutical chemistry, and biotechnology.				
Course Contents & Topics	computer - Drug-red - Proteins - Metals in - DNA-Dru	 Drug discovery, design, and development: lead discovery, pharmacophore, structure-activity relationships (SAR) computer-aided drug design, combinatorial chemistry and high-throughput drug screening Drug-receptor interactions Proteins (and enzymes) and nucleic acids as drug targets Metals in medicine DNA-Drug interactions Drug metabolism and prodrugs and drug delivery 				
Course Learning		essful completion of this course, students should be able to:				
Outcomes	CLO 1	demonstrate knowledge of drug discovery, design and development	:			
	CLO 2	understand drug-biomolecule interactions where appropriate				
	CLO 3	gain appropriate knowledge of drug metabolism and drug delivery				
Pre-requisites (and Co-requisites and Impermissible combinations)	this cours	CHEM3441 or CHEM3442; and Not for students who have passed in se.	BPHM3133, or al	ready enrolled in		
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021 - 2022 : Y	Examination	May		
Grade Descriptors (A+ to F)	A	Demonstrate thorough knowledge and understanding of essential facts, concepts, p foundation knowledge of medicinal chemistry, especially those related to drug discodrug lead optimization; structure activity relationship; pharmacokinetics; drug deliver ability to apply and integrate knowledge and theory relating to the basic foundationstrong ability to analyze novel problems and critical use of data and experimental conclusions relating to the basic principles and knowledge of medicinal chemistry. Deformedicinal chemistry, especially in drug discovery and metabolism.	very, design and develory and its relevance to n knowledge of medici I results to draw appro emonstrate highly effec	opment, drug targets toxicity. Show strong nal chemistry. Show opriate and insightful tive basic techniques		
	В	Demonstrate substantial command of knowledge and understanding of essential fact to the basic foundation knowledge of medicinal chemistry; especially those related t drug targets; drug lead optimization; structure activity relationship; pharmacokinetics Show evidence to apply and integrate knowledge and theory relating to the basic fo Show evidence to analyze novel problems and correct use of data and experimen relating to the basic principles and knowledge of medicinal chemistry. Demonstra chemistry, especially in drug discovery and metabolism.	to drug discovery; designs; drug delivery and its undation knowledge of tall results to draw app	gn and development relevance to toxicity medicinal chemistry propriate conclusions		
	С	Demonstrate general but incomplete command of knowledge and understanding of theories relating to the basic foundation knowledge of medicinal chemistry; especially development; drug targets; drug lead optimization; structure activity relationship relevance to toxicity. Show evidence of some abilities to apply and integrate kn	those related to drug or pharmacokinetics; dr	discovery; design and rug delivery and its		

	erroneous use of omedicinal chemist drug discovery an	foundation knowledge of medicinal chemistry. Show ability to analyze problems to most familiar situations and me erroneous use of data and experimental results to draw appropriate conclusions relating to the basic principles an medicinal chemistry. Demonstrate moderately effective basic techniques, basic techniques for medicinal chemistry drug discovery and metabolism.				
	relating to the ba development; dru relevance to toxic foundation knowle correct but errone	al but limited command of knowledge and u sic foundation knowledge of medicinal ch- g targets; drug lead optimization; structur city. Show evidence of limited abilities to adge of medicinal chemistry. Show limited a ous use of data and experimental results to dicinal chemistry. Demonstrate partially effe tabolism.	emistry; especially those related to drug re activity relationship; pharmacokinetics apply and integrate knowledge and the ability to analyze problems to most famili o draw appropriate conclusions relating to	g discovery; design and s; drug delivery and its bry relating to the basic iar situations and mostly the basic principles and		
	theories relating to development; dru relevance to toxic foundation knowle erroneous use of	or no evidence of command of knowledge to the basic foundation knowledge of medicina g targets; drug lead optimization; structur ity. Show little or no evidence of abilities to edge of medicinal chemistry. Show little or data and experimental results to draw appropry. Demonstrate minimally effective basic te	al chemistry; especially those related to dr re activity relationship; pharmacokinetics o apply and integrate knowledge and the r no ability to analyze problems to mos priate conclusions relating to the basic prii	rug discovery; design and s; drug delivery and its error relating to the basic t familiar situations and nciples and knowledge of		
Course Type	Lecture-based course					
Course Teaching	Activities	Details		No. of Hours		
& Learning Activities	Lectures					
	Tutorials	or discussion		12		
	Reading / Self study					
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		10	CLO 1,2,3		
	Examination		60	CLO 1,2,3		
	Presentation	(two presentations)	20	CLO 1,2,3		
	Test	midterm	10	CLO 1,2,3		
Required/recommended reading and	Medicinal Chemistry- An I	al Chemistry (3/e), G.L. Patrick, Ox ntroduction, G. Thomas, John Wiley	y, 2000			
online materials	U	04) Nat. Rev. Drug Dis., Cellular pro	<u> </u>	• • •		
Additional Course Information	This course is also offered	I to RPg students, and the course of	ode for RPg students is CHEM61	13.		

CHEM4147	Supram	olecular chemistry (6 credits)	Academic Year 2020				
Offering Department	Chemistr		Quota 40				
Course Co-ordinator	Dr H Y A	Dr H Y Au-Yeung, Chemistry (hoyuay @hku.hk)					
Teachers Involved		u-Yeung,Chemistry)					
	(Dr K Ok	uro,Chemistry)					
	(Dr Y F V	Vang,Chemistry)					
Course Objectives	Supramo	lecular chemistry concerns the chemistry beyor	nd that of molecules. This course aims at introduc				
•	students	to concepts and techniques in supramolecular of	chemistry, demonstrating how molecular assembly a				
			s, and their relevance to material and biological science				
Course Contents			r; non-covalent interactions and common supramoleci				
& Topics			lected topics in modern supramolecular chemistry, si				
			er molecules, synthetic receptors, interlocked structur				
			biomolecules and biomaterials, will also be discussed				
Course Learning	On successful completion of this course, students should be able to:						
Outcomes		Inderstand important principles and concepts in su					
			nature of non-covalent interactions and to apply the				
			ne structures, properties and functions of differe				
		upramolecular systems	cauctarce, properties and randome or amere				
			data of supramolecular systems and extract releva				
		hemical information to explain the properties of the					
Pre-requisites	_	CHEM3341 and CHEM3441	o dapramologalar dyblomo				
and Co-requisites	rass III C	FILMSS41 and Chemis441					
and Impermissible							
combinations)							
Offer in 2020 - 2021	V 2n	d com Offer in 2021 2022 : V	Examination May				
		Y 2nd sem Offer in 2021 - 2022 : Y Examination May					
Grade Descriptors (A+ to F)		Demonstrate thereugh knowledge and understanding of					
•	A	integrate knowledge in supramolecular chemistry in exp	ecular recognition and self-assembly. Show strong ability to apply laining the formation and properties of, and in designing differ and interpret experimental data to draw appropriate conclusions rela				
•	A	especially those relating to non-covalent interactions, mole integrate knowledge in supramolecular chemistry in exp supramolecular systems. Show strong ability to analyse ar to the advanced principles and properties of supramolecular	ecular recognition and self-assembly. Show strong ability to apply plaining the formation and properties of, and in designing differ di interpret experimental data to draw appropriate conclusions rela ar systems.				
•	В	especially those relating to non-covalent interactions, mole integrate knowledge in supramolecular chemistry in exp supramolecular systems. Show strong ability to analyse are to the advanced principles and properties of supramolecular Demonstrate substantial knowledge and understanding of especially those relating to non-covalent interactions, mo integrate knowledge in supramolecular chemistry in exp	ecular recognition and self-assembly. Show strong ability to apply olaining the formation and properties of, and in designing differ di interpret experimental data to draw appropriate conclusions rela ar systems. essential facts, concepts and principles in supramolecular chemis elecular recognition and self-assembly. Show evidence to apply olaining the formation and properties of, and in designing differ interpret experimental data to draw appropriate conclusions relating.				
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Course Type	Lecture-based course	Lecture-based course			
Course Teaching	Activities	No. of Hours			
& Learning Activities	Lectures			36	
	Tutorials			12	
	Reading / Self study			100	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignments		15	CLO 1,2,3	
	Examination		55	CLO 1,2,3	
	Presentation		15	CLO 1,2,3	
	Test		15	CLO 1,2,3	
Required/recommended reading and online materials	Modern Physical Organic Chemist	Supramolecular Chemistry by Jonathan W. Steed and Jerry L. Atwood, John Wiley & Sons, Ltd., 2nd Edition, 2009 Modern Physical Organic Chemistry by Eric V. Anslyn and Dennis A. Dougherty, University Science Books, 2006 References to specialist texts and other published materials will be made throughout the course.			

CHEM4148	Frontier	rs in Modern Ch	nemical Science (6 credits)	Academic Yea	r 2020		
Offering Department	Chemistry		•	Quota	60		
Course Co-ordinator	Dr X Li, C	Chemistry (xiangli@	Dhku.hk)				
Teachers Involved	,	// Tse,Chemistry)					
		ang,Chemistry)					
0		Chemistry)	La de la de la Manada de la companya		.:-!:		
Course Objectives	Modern chemistry is thought to be the "central science" as it plays a critical role in related biological, physical medical, and engineering disciplines. This course aims to introduce students to the newest concepts and technological breakthroughs in chemical sciences. Throughout the course, students will be introduced to how the interplay among molecules, materials, and interfaces leads to unprecedented functionalities that contribute to innovations in biology and medicine, smart materials, and sustainable energy schemes.						
Course Contents			interdisciplinary area of chemistry with bio		es. Covered topi		
& Topics	stimuli-res conversio materials,	include chemical genetics, epigenetics and proteomics; chemical biology for drug discovery and development; stimuli-responsive nanomaterials; autonomous macromolecular motion; future power landscape; renewable energy conversion and utilization. Examples in protein posttranslational modifications, active colloidal, thermoelectric materials, molecular machines, advanced rechargeable batteries, and next-generation fuel cells and electrolysers will be discussed.					
Course Learning		n successful completion of this course, students should be able to:					
Outcomes		•	nt principles and topical trends in chemical	sciences			
	CLO 3 in	CLO 2 demonstrate understanding of future directions in biomedical chemistry, nanomatertials, and energy sciences and applying this knowledge in comparing and contrasting various emergent technologies CLO 3 interpret and analyse recent published research data in the field of chemistry and extract relevant chemical information to explain the observed properties and phenomena associated to the chemical systems					
Pre-requisites and Co-requisites and Impermissible combinations)	Pass in CHEM3341 and CHEM3441.						
Offer in 2020 - 2021	Y 2nd	d sem Offer in 20	021 - 2022 : Y	Examination	May		
Grade Descriptors (A+ to F)	A	Demonstrate thorough knowledge and understanding of essential facts, concepts and principles in chemical sciences, especially those relating to biomedical chemistry, nanomaterials, and energy sciences. Show strong ability to apply and integrate knowledge in chemical sciences in explaining the formation and properties of chemical species and in designing different chemical systems. Show strong ability to analyse and interpret experimental data to draw appropriate conclusions relating to the advanced principles and properties of chemical systems.					
	Demonstrate substantial knowledge and understanding of essential facts, concepts and principles in chemical sciences, especially those relating to biomedical chemistry, nanomaterials, and energy sciences. Show evidence to apply and integrate knowledge in chemical sciences in explaining the formation and properties of chemical species and in designing different chemical systems. Show evidence to analyse and interpret experimental data to draw appropriate conclusions relating to the advanced principles and properties of chemical systems.						
	C Demonstrate general but incomplete amount of knowledge and understanding of essential facts, concepts and principles in chemical sciences, especially those relating to biomedical chemistry, nanomaterials, and energy sciences. Show some ability to apply and integrate knowledge in chemical sciences in explaining the formation and properties of chemical species and in designing different chemical systems. Show some ability to analyse and interpret experimental data to draw appropriate conclusions relating to the advanced principles and properties of chemical systems.						
	Demonstrate partial but incomplete command of knowledge and understanding of essential facts, concepts and principles in chemical sciences, especially those relating to biomedical chemistry, nanomaterials, and energy sciences. Show evidence of limited ability to apply and integrate knowledge in chemical sciences in explaining the formation and properties of chemical species and in designing different chemical systems. Show evidence of limited ability to analyse and interpret experimental data to draw appropriate conclusions relating to the advanced principles and properties of chemical systems.						
	Fail Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts and principles chemical sciences, especially those relating to biomedical chemistry, nanomaterials, and energy sciences. Show little or a ability to apply and integrate knowledge in chemical sciences in explaining the formation and properties of chemical species a in designing different chemical systems. Show little or no ability to analyse and interpret experimental data to draw appropria conclusions relating to the advanced principles and properties of chemical systems.						
Course Type		pased course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures						
	Tutorials				12		
	Reading / Self study		Details	Mainhtin ! f!!	100		
Learning Activities			LICTALIS	Weighting in final	Assessment		
	Methods	5		course grade (%)	Methods to CLO Mappin		
& Learning Activities Assessment Methods			(20% Tests/Assignments; 5%	course grade (%)	Methods to CLO Mappin CLO 1,2,3		
Learning Activities Assessment Methods	Methods Assignment	ents		25	to CLO Mappin CLO 1,2,3		
& Learning Activities Assessment Methods	Methods	ents	(20% Tests/Assignments; 5%	• • • • • • • • • • • • • • • • • • • •	to CLO Mappir		

Additional	Course
Information	n

This course is also offered to RPg students, and the course code for RPg students is CHEM6118.

CHEM4241	Modern	chemical instrume	ntation and applications (6 c	redits) Academic Yo	ear 2020		
Offering Department	Chemistry			Quota	50		
Course Co-ordinator	Dr I K Chu	ı, Chemistry <i>(ivankchu</i> (@hku.hk)				
Teachers Involved	,	u,Chemistry) han,Chemistry)					
Course Objectives		• • • • • • • • • • • • • • • • • • • •	ovide an understanding of modern	instrumentation covering	ng both fundamental		
	principles	inciples and practical aspects of instrument design. The course will be of particular benefit to those pursuing a gher research degree or a career in technical sales/service.					
Course Contents	_		Liquid Chromatography-Tanden	n Mass Spectrometry	for Proteomics &		
& Topics	Laser Spe frequency noise enha Atomic Pla spectrome detectors; Atomic X-I	All Alexandress Al					
Course Learning			course, students should be able to:				
Outcomes	CLO 1 ex	plain the principles on tification and quantification and quantification.	of the modern mass spectromet cation	ric methods for protein			
		piain now proteins al oteomics experiments	re identified and sequenced exp	erimentally and now da	ta is generated in		
			ng techniques and software tools to for target quantitative analysis of si	, , ,	proteomics data		
	CLO 5 ex		of the laser spectroscopy, atomi		and atomic x-ray		
	CLO 6 describe the basic experimental set up and the properties of the basic components of the instruments used in the laboratory classes						
Pre-requisites	Pass in Ch	•					
(and Co-requisites and Impermissible combinations)	. 435 5.						
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2	022 : Y	Examination	Dec		
Grade Descriptors	Α		wledge and understanding of essential facts				
(A+ to F)	chemical instrumentations and applications. Show strong ability to apply and integrate knowledge and theory, and strong ability to analyze problems related to fundamental principles and practical aspects of instrument design. B Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemical instrumentations and applications. Show evidence to apply and integrate knowledge and theory, and ability to analyze problems related to fundamental principles and practical aspects of instrument design. C Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles and						
		theories relating to the modern chemical instrumentations and applications. Show evidence of some abilities to apply and integrate knowledge and theory, and to analyze problems to most familiar situations to fundamental principles and practical aspects of instrument design.					
	D	Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemical instrumentations and applications. Show evidence of limited abilities to apply and integrate knowledge and theory, and limited ability to analyze problems to most familiar situations related to fundamental principles and practical aspects of instrument design.					
	Fail Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principle theories relating to the modern chemical instrumentations and applications. Show little or no evidence of abilities to app integrate knowledge and theory, and little or no ability to analyze problems to most familiar situations related to fundar principles and practical aspects of instrument design.						
Course Type		th laboratory componer					
Course Teaching	Activities		Details	No. of Hours			
& Learning Activities	Lectures				24		
	Laborator	у			16		
	Tutorials	Calf atudy			12		
Accomment Mathed		Self study	Deteile	Walashia ! f!!	100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examinati	on		65	CLO 1,2,3,4,5,6		
	Laborator	y reports	(lab performance, reports, test, oral test)	35	CLO 1,2,3,4,5,6		
Required/recommended reading and online materials	D.A. Skoo	g, F.K. Holler, S.R. Cro	contemporary mass spectrometry (Vouch: Principles of Instrumental Ana will be made throughout the course.	lysis (Thomson, látest edi	tion)		
Additional Course			ry. Students must complete ALL e		reports to pass this		
Information	course.		g students, and the course code for				

CHEM4242	Analytical chemistry (6 credits)	Academic Year	2020
Offering Department	Chemistry	Quota	50
Course Co-ordinator	Dr W T Chan, Chemistry (wtchan@hku.hk)		
Teachers Involved	(Dr W T Chan, Chemistry)		
Course Objectives	This course focuses on the basic principle, practice and methodology in chem course emphasizes on the integration of analytical concepts and technologie bioanalytical problems. This course will be particularly useful for students who p analytical and bioanalytical chemistry.	s to solve practic	al analytical and

Course Contents & Topics		analytical methods; Vali	s: Statistical treatment & evalua dation of analytical methods; Qu			
	preparation separation chromatog on mass s	n and enrichment techn technologies for com graphic analysis and spe pectrometry ased design of analyti and experience relate	ctical techniques of sample p iques for biomedical, pharmace plex mixture analysis (e.g. mu ectroscopic detection; Analytes of cal strategy for chemical & bio d to selected fields of research	utical and forensic chemical Itidimensional LC); Derivati characterization and detection ochemical analysis: Expert	analysis; Advanced zation methods for on techniques based sharing of practica	
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	va	lidate analytical method	to assess analytical measurements and results and the working principle of dif			
			0	referit analytical techniques	and recognize their	
		vantages and limitations		and bicanalytical problems		
Due ve vicitee		egrate different analytic HEM3241 or CHEM324	al techniques to solve analytical	and bloanalytical problems		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass III C	HEM3241 OF CHEM324	2			
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2		Examination	May	
Grade Descriptors (A+ to F)	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities, logical thinking and capability to apply knowledge learnt to solv a wide range of complex issues and problems related to chemical analysis. Apply highly effective organization and presentatio skills as shown in class work.				
	В	Demonstrate a substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities, logical thinking, and capability to apply knowledge learnt to solve a wide range of complex issues and problems related to chemical analysis. Apply effective organization and presentation skills as shown in class work.				
	С	Demonstrate a general command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of analytical and critical abilities, logical thinking, and ability to apply knowledge learnt to solve a wide range of complex issues and problems related to chemical analysis. Apply effective organization and presentation skills as shown in class work.				
	D	Demonstrate a partial but limited command of knowledge and skills required for attaining some of the course learning outcomes in Food and Water Analysis. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems related to chemical analysis. Apply limited or barely effective organization and presentation skill as shown in class work.				
	Fail Demonstrate little or no evidence for the command of knowledge and skills required for attaining the course learning outcome: Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solv problems related to chemical analysis. Organization and presentation skills are minimally effective or ineffective as shown i class work.					
Course Type	Lecture wi	th laboratory componen	t course			
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				24	
	Laborator	у	6 x 4-hour of laboratory practical		24	
	Tutorials				6	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examinat	on		60	CLO 1,2,3	
	Laborator		Experiment & Lab report	15	CLO 1,2	
	Presentat	ion		10	CLO 1,2,3	
	Test			15	CLO 1,2,3	
Required/recommended reading and online materials	edition)	•	r, S.R. Crouch: Fundamentals o , D. lossifidis: Bioanalytical Cher		, ,	
	Reference	s to specialist texts and	other published materials will be	made throughout the course	e. ,	
Additional Course Information	Laboratory course.	classes are mandatory	/. Students must complete ALL	experiments and laboratory	reports to pass thi	

CHEM4341	Advar	ed inorganic chemistry (6 credi	ts)	Academic Year	2020				
Offering Department	Chemis	y	•	Quota	50				
Course Co-ordinator	Prof C I	Che, Chemistry (cmche@hku.hk)							
Teachers Involved	(Prof H	l Che,Chemistry) Sun,Chemistry) / W Yam,Chemistry)							
Course Objectives	topics in	This course is a continuation from Intermediate Inorganic Chemistry, giving further and more detailed treatment to topics in Inorganic Chemistry and new areas of interest. Problem based learning on selected advance topics will be introduced in the later part of the course. This course also aims to prepare students for graduate work.							
Course Contents & Topics	bonds,	Selected advanced topics of current interest. Examples include metal-metal bonds and metal-ligand multiple bonds, inorganic and supramolecular photochemistry, lanthanide chemistry, bio-inorganic and medicinal chemistry, and activation of small molecules by metal complexes.							
Course Learning	On successful completion of this course, students should be able to:								
Outcomes	CLO 1 understand the principles and concepts of inorganic and supramolecular photochemistry								
	CLO 2 understand the electronic structure and bondings of novel metal-metal and metal-ligand multiple bonded metal complexes								
	CLO 3 understand and realize the activation of small molecules by transition metal complexes and realize the importance of such activation in chemical catalysis of global interest, green chemistry and energy saving reactions								
	CLO 4	CLO 4 understand the role of metal complexes in bio-inorganic and medicinal chemistry							

Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in C	HEM3341						
Offer in 2020 - 2021	Y 1st	Y 1st sem Offer in 2021 - 2022 : Y Examination						
Grade Descriptors (A+ to F)	A	in inorganic chemistry. Sh	wledge and understanding of ow strong ability to apply and istry. Apply highly effective or	d integrate knowledge and	theory, and strong			
	В							
	С	theories relating to the mor	ncomplete command of known e advanced knowledge in inou d to analyze problems to mos ational skills.	rganic chemistry. Show evid	ence of some abilitie	es to apply and integrate		
	D	relating to the more adva knowledge and theory, and	nited command of knowledge nced knowledge in inorganic d limited ability to analyze pro ional and presentational skills.	chemistry. Show evidence oblems to most familiar situ	of limited abilities	to apply and integrate		
	Fail	theories relating to the mointegrate knowledge and the	vidence of command of knowner advanced knowledge in in the heory, and little or no ability active organizational and prese	norganic chemistry. Show lit to analyze problems to mos	tle or no evidence	of abilities to apply and		
Course Type	Lecture-b	ased course						
Course Teaching	Activitie	S	Details			No. of Hours		
& Learning Activities	Lectures					36		
	Tutorials		including literature survey & presentation			12		
	Reading	/ Self study				100		
Assessment Methods and Weighting	Methods	•	Details		nting in final se grade (%)	Assessment Methods to CLO Mapping		
	Assignm	ents			20	CLO 1,2,3,4		
	Examina	tion			60	CLO 1,2,3,4		
	Test		(Quiz/ test)		20	CLO 1,2,3,4		
Required/recommended reading and online materials			and Bochmann: Advand d other published materi					
Additional Course Information	take this	course.)	nded to take CHEM4142 g students, and the cour	, , , , , , ,		•		

CHEM4342	Organo	ometallio	c chemistr	y (6 cre	dits)				Academic Year	20	020
Offering Department	Chemistry	ry							Quota	40)
Course Co-ordinator	Dr H Y Au	u-Yeung,	Chemistry (hoyuay@	hku.hk)						
Teachers Involved	(Dr J He,	,Chemistr									
Course Objectives	II. The co	To give further, more detailed, treatment to organometallic chemistry mentioned in CHEM3341 Inorganic Chemistry II. The course also aims to introduce and familiarize students with advanced laboratory techniques, and to prepare students for graduate work in inorganic and organometallic chemistry.									
Course Contents & Topics									uster chemistry. I hthesis and cataly		
		nipulation							niques which inc terization by vari		
Course Learning	On succe	essful con	npletion of th	nis course	, students	should be	e able to:				
Outcomes			d the advanc								
	CLO 2 demonstrate knowledge and understanding in the bonding, structure and reactivities of main group and transition metal organometallics, especially in transition metal clusters, metal alkyls, metal alkylidenes and metal alkylidynes										
	CLO 3 demonstrate knowledge and understanding in the application of organometallics in organic synthesis, polymerization and catalysis										
									thesis and manip ectroscopic meth		ion of air- and
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in C	CHEM334	1								
Offer in 2020 - 2021	Y 1st	st sem C	Offer in 2021	- 2022 : Y	/				Examination	D	ec
Grade Descriptors (A+ to F)	A	detailed main gro synthesi concepts results t chemisti	and advanced oup and transitions and catalysis, so forganomet of draw appropry. Demonstrates	treatment of on metal org . Show strorgallic chemis oriate and in the highly effe	of organome ganometallic ng ability to a try. Show st sightful con ctive advance	callic chemis s; transition in apply and introng ability to clusions related laborator	try, especially metal cluster egrate knowled analyze not the ary skills and to	y those relat chemistry; a edge and the ovel problemand dvanced pri echniques, e	rinciples, and theorie ed to structure, bond application of orga or relating to the act or critical use of conciples and applications specially in the synth oscopic methods.	ing a nom vand lata a	and reactivities or etallics in organic ed principles and and experimenta of organometallic
	В	Demons to the m reactiviti organon advance data an organon	trate substantia nore detailed an es of main g netallics in orga ed principles an d experimenta netallic chemist	al command nd advance roup and t anic synthes nd concepts I results to try. Demons	of knowledged treatment transition mais and cataly of organom draw apprestrate effecti	e and under of organometal organometal organometal esis. Show e etallic chemi opriate conduce ore advanced	standing of e etallic chemis metallics; tra vidence to a istry. Show e clusions rela d laboratory	ssential facts stry, especia ansition meta oply and inte vidence to a ting to the skills and te	s, concepts, principles lly those related to s al cluster chemistry grate knowledge and inalyze novel probler advanced principles chniques, especially various spectroscopic	tructi and thed ns ar and in th	ure, bonding and d application of ory relating to the nd correct use of applications of ne synthesis and
	С	Demons	trate general b	ut incomple	te comman	of knowled	dge and unde	erstanding o	f essential facts, con mistry, especially thos	cepts	s, principles, and

	D	organometallics in organic relating to the advanced pi situations and mostly corre advanced principles and a and techniques, especial characterization by various Demonstrate partial but lim	main group and transition me synthesis and catalysis. Show inciples and concepts of orga- tot but erroneous use of data pplications of organometallic ly in the synthesis and n spectroscopic methods. nited command of knowledge and advanced treatment of	v evidence of some abilities anometallic chemistry. Show and experimental results to chemistry. Demonstrate monanipulation of air- and mand understanding of esser	to apply and integra ability to analyze of draw appropriate conditional derately effective a noisture-sensitive stial facts, concepts	ate knowledge and theory problems to most familiar onclusions relating to the dvanced laboratory skills compounds and their s, principles, and theories
		and reactivities of main organical metallics in organic theory relating to the advar most familiar situations an relating to the advanced laboratory skills and technic characterization by various	group and transition metal c synthesis and catalysis. Sh nced principles and concepts d mostly correct but erroneou principles and applications of ques, especially in the synthe spectroscopic methods.	organometallics; transition m ow evidence of limited abili of organometallic chemistry is use of data and experime of organometallic chemistry, sis and manipulation of air-a	netal cluster chem ties to apply and i Show limited abili net results to draw Demonstrate par and moisture- sensi	istry; and application of integrate knowledge and by to analyze problems to appropriate conclusions tially effective advanced tive compounds and their
	Fail	theories relating to the mou bonding and reactivities of organometallics in organic theory relating to the advar to most familiar situations advanced principles and a and techniques, especial characterization by various	· · · · · · · · · · · · · · · · · · ·	atment of organometallic che stal organometallics; transitio w little or no evidence of ab of organometallic chemistry, and experimental results to c chemistry. Demonstrate mi	mistry, especially to n metal cluster che ilities to apply and Show little or no a draw appropriate con nimally effective an	hose related to structure, mistry; and application of integrate knowledge and bility to analyze problems onclusions relating to the dvanced laboratory skills
Course Type	Lecture wi	th laboratory compone	nt course			
Course Teaching	Activities		Details			No. of Hours
& Learning Activities	Lectures					24
	Laborator	у				30
	Tutorials					5
	Reading /	Self study				100
Assessment Methods and Weighting	Methods		Details		nting in final se grade (%)	Assessment Methods to CLO Mapping
	Assignme	ents			15	CLO 1,2,3,4
	Examinat	ion			60	CLO 1,2,3,4
	Laborator	y reports			15	CLO 1,2,3,4
	Test				10	CLO 1,2,3,4
Required/recommended reading and online materials	C. Elscher	nbroich and A. Salzer: (llic Chemistry of the Tra Organometallics - A Cor other published materia	ncise Introduction (VCF	l, 1992, 2nd rev	
Additional Course		•	ry. Students must com			
Information	course.	, ciasses are manualo	ry. Students must com	piete ALL experiments	and laboratory	reports to pass triis

CHEM4441	Advanc	ed organic chemistr	y (6 credits)	Academic Year	2020			
Offering Department	Chemistr	У	· · · · · · · · · · · · · · · · · · ·	Quota	40			
Course Co-ordinator	Prof D Ya	ang, Chemistry (yangdan	@hku.hk)					
Teachers Involved	(Dr J He,	Chemistry) ang,Chemistry)						
Course Objectives		To provide students with knowledge in organic chemistry reaction mechanisms and organic compound structure determination.						
Course Contents & Topics		The course covers chemical bonding, advanced stereochemistry, conformational analysis, techniques investigating reaction mechanisms, reactive intermediates, rearrangement reactions, and pericyclic reactions.						
Course Learning	On succe	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 d	escribe, analyze and inte	rpret the structure and reactivity relationship	of organic molecule	es			
		lentify and predict the seactions	electivities (chemoselectivity, regioselectivity	y and stereoselec	tivity) in organic			
			paches to study organic mechanisms					
			nding and working knowledge of pericyclic trenes), and polar rearrangements	reactions, reactive	ve intermediates			
	CLO 5 suggest reasonable mechanistic pathways for some types of organic reactions							
	CLO 6 a	pply the knowledge of rea	action mechanisms in design of synthetic rout	es for organic com	pounds			
and Impermissible combinations)								
Offer in 2020 - 2021		t sem Offer in 2021 - 20		Examination	Dec			
Grade Descriptors (A+ to F)	A	learning outcomes. Show st	tery at an advanced level of extensive knowledge and rong analytical and critical abilities and logical thinking, e range of complex, familiar and unfamiliar situations.					
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations.							
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems.							
	Fail	of analytical and critical abilit	ence of command of knowledge and skills required for a ties, logical and coherent thinking. Show very little or no					
Course Type	Lecture-b	ased course						
Course Teaching	Activitie	S	Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials				12			
	Reading	/ Self study			100			
Assessment Methods								

and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Examination		70	CLO 1,2,3,4,5,6
	Test		30	CLO 1,2,3,4,5,6
Required/recommended reading and online materials	F.A. Carey and R.J. Sunberg, "Adv 2007. "Organic Chemistry", by Paula Y. E I. Fleming, "Pericyclic Reactions",	Bruice, 2016, 8th Edition, Pearson, v		
Additional Course Information	J	students, and the course code for F	RPg students is CHEM61	14.

CHEM4443	Integrate	ed organic synthes	is (6 credits)	Academic Yea	ar 2020		
Offering Department	Chemistry			Quota	50		
Course Co-ordinator	Dr Huang	Z X, Chemistry (huanga	zx@hku.hk)				
Teachers Involved	(Dr Huang	Z X,Chemistry)					
Course Objectives	To introduce aspects of modern organic reactions with relevance to and in the context of the synthesis of natural products, drugs and medicinal chemistry to provide an integrated approach to the subject, and to provide training advanced organic laboratory skills, and further hands-on experience in synthesis and characterization, as preparation for graduate studies or research in organic chemistry.						
Course Contents & Topics	Building on the organic chemistry covered in the foundational courses CHEM1003 and CHEM2402, this coupresent modern synthetic methods and synthetic planning. The course is organized into units based on targ molecules. In each unit, the chemical biology of these compounds are briefly presented and the synthethese molecules are introduced, accompanied by in-depth discussions of the reactions involved with empth their mechanisms, selectivity, stereochemistry, scope and limitations. Concept of synthetic design incretrosynthetic analysis, stereoselectivity and enantioselective control elements will be emphasized. A lab section provides training in the practical skills of synthesis.						
Course Learning			course, students should be ab	le to:			
Outcomes	CLO 1 un	derstand the rationale emistry		ms of various reactions and re	eagents in organic		
	CLO 3 pe	rform organic synthesis		level of technical difficulty, using	g additional skills ir		
		0	and literature search, to learn	chemistry independently			
Pre-requisites (and Co-requisites and Impermissible combinations)		HEM3441; or HEM3441 (without lab c	component) and CHEM3443				
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	2022 : Y	Examination	May		
Grade Descriptors	Α	Demonstrate a thorough m	astery at an advanced level of know	ledge and understanding of concepts, p	principles, reactions an		
(A+ to F)		mechanisms related to synthetic organic chemistry. Show a strong ability to integrate knowledge and theory, and a strong abil to analyze novel synthetic organic chemistry situations and problems. Show a critical use of knowledge and data to apply to t solution of novel and complex synthetic problems. Demonstrate highly effective organization and application of lab skills a techniques in synthetic experiments.					
	В	Demonstrate a substantial command of knowledge and understanding of concepts, principles, reactions and mechanisms relate to synthetic organic chemistry. Show evidence of ability to integrate knowledge and theory, and evidence of ability to analyz synthetic organic chemistry situations and problems. Show a correct use of knowledge and data to apply to the solution of son novel and most familiar synthetic problems. Demonstrate effective organization and application of lab skills and techniques synthetic experiments.					
	Demonstrate a general but incomplete command of knowledge and understanding of concepts, principles, reactions and mechanisms related to synthetic organic chemistry. Show evidence of some ability to integrate knowledge and theory, and evidence of some ability to analyze synthetic organic chemistry situations and problems. Show a correct use of knowledge to apply to the solution of most familiar problems. Demonstrate moderately effective organization and application of lab skills and techniques in synthetic experiments.						
	Demonstrate a partial but limited command of knowledge and understanding of concepts, principles, reactions and mechanisms related to synthetic organic chemistry. Show evidence of a limited ability to integrate knowledge and theory, and a limited ability to analyze familiar situations and problems. Show some correct but erroneous use of knowledge to apply to the solution of most familiar problems. Demonstrate partially effective organization and application of lab skills and techniques in synthetic experiments.						
	Fail Demonstrate little or no evidence of command of knowledge and understanding of concepts, principles, react mechanisms related to synthetic organic chemistry. Show little or no evidence of ability to integrate knowledge and synthetic organic chemistry, and little or no ability to analyze most familiar situations and problems. Show mostly error of knowledge to apply to the solution of familiar problems. Demonstrate minimally effective organization and applications and techniques in synthetic experiments.						
Course Type		th laboratory componer					
Course Teaching	Activities		Details		No. of Hours		
Learning Activities	Lectures				24		
	Laborator	•			25		
		Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
and Weighting							
nd Weighting	Assignme		(Problem sets)	10	CLO 1,2,4		
nd Weighting	Assignme Examinati		(Problem sets)	50	CLO 1,2,4 CLO 1,2,3,4		
and Weighting		on	(Problem sets) (Practicals & lab test)				
and Weighting	Examinati	on		50	CLO 1,2,3,4		
and Weighting Required/recommended reading and online materials	Examinati Laborator Test Reference	on y reports Books: Organic synthe		50 25 15 Science Publications	CLO 1,2,3,4 CLO 1,2,3,4		

CHEM4444	Chemica	al biology (6 credits	5)	Academic Yea	r 2020			
Offering Department	Chemistry	'		Quota	50			
Course Co-ordinator	Prof X C Li, Chemistry (xuechenl@hku.hk)							
Teachers Involved	(Prof X C Li,Chemistry)							
Course Objectives	generate	To understand how to use chemical approaches to emulate biological systems to study natural molecules and generate new functional molecules. Useful as an introduction to research in areas of chemical biology, medicinal chemistry and biotechnology.						
Course Contents & Topics			cids, protein chemistry, pr and tools and techniques in	rotein posttranslational modification chemical biology.	ns, carbohydrate			
Course Learning	On succes	ssful completion of this	course, students should be a	able to:				
Outcomes	CLO 1 ur	nderstand chemical biolo	ogy approaches in studying	biology				
	wi	ht altered functions	·	produce natural biomolecules and	new biomolecules			
			and traditional biology app	roaches in drug discovery				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Bi	IOC3601 or CHEM3441						
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	2022 : Y	Examination	May			
Grade Descriptors (A+ to F)	A	learning outcomes. Show s to apply knowledge to a w presentational skills. Insight and to quote/reference aptly	trong analytical and critical abilitie: vide range of complex, familiar ar tful use and critical analysis / evalu /.	ensive knowledge and skills required for a s and logical thinking, with evidence of origind and unfamiliar situations. Apply highly effect uation of information drawn from a full range	nal thought, and ability ive organizational and of high quality sources			
	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familia and some unfamiliar situations. Apply effective organizational and presentational skills. Critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly.							
	С	outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Use of relevant information from sources, showing ability to make comparisons between different interpretations and to quote/reference aptly.						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Use and reference of several sources, but mainly through summary rather than analysis and comparison.							
	Fail	Demonstrate little or no evidence of analytical and critical a	dence of command of knowledge a bilities, logical and coherent thinl I presentational skills are minimally	and skills required for attaining the course le king. Show very little or no ability to appl y effective or ineffective. Limited use of sec	y knowledge to solve			
Course Type	Lecture-ba	ased course						
Course Teaching	Activities	3	Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials		tutorials/discussion		12			
	Reading /	Self study			100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignme	ents		5	CLO 1,2,3			
	Examinat	ion		50	CLO 1,2,3			
	Presentation			25	CLO 1,2,3			
	Test			20	CLO 1,2,3			
Required/recommended reading and online materials	Foundatio	ns of Chemical Biology	by C.M. Dobson, J.A. Gerra	ard and A.J. Pratt.				
Course Website	Nil							
Additional Course	Nil							
Information								

CHEM4541	Physical chemistry III: statistical thermodynamics and kinetics theory (6 credits)	Academic Year	2020			
Offering Department	Chemistry	Quota	40			
Course Co-ordinator	, Chemistry ()					
Teachers Involved						
Course Objectives	The course presents fundamental principles and topics on statistical thermo provide a solid foundation for students intending to further their studies in ph					
Course Contents & Topics	Principles of Statistical Thermodynamics - Thermodynamic laws - Ensembles and partition functions: microcanonical, canonical and grand-ca - Systems of independent molecules: ideal gas - Molecular degrees of freedom: translation, rotation, vibration, and electronical lead gas mixture: chemical equilibrium, binding, and titration - Lattice statistics: Ising model and phase transition - Quantum statistics Chemical equilibrium and kinetics theory - Rate theory: collision theory, transition state theory					
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 understand and use the terminology and nomenclature in statistical thermodynamics and topics discussed in the course CLO 2 demonstrate knowledge and understanding of basic concepts in statistical thermodynamics CLO 3 understand correlation between macroscopic observables and microscopic statistical model systems					

Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	CHEM3541				
Offer in 2020 - 2021	N O	ffer in 2021 - 2022 : N		Examination		
Grade Descriptors (A+ to F)	Α		advanced level of extensive knowledge of trong analytical / critical abilities and logical th			
	В	·				
	С		nmand of knowledge of statistical thermodyna ly the knowledge to familiar situations.	mics and reaction dynamics. D	Demonstrate evidence of	
	D	Partial but limited commar limited evidence of analytical	d of knowledge of knowledge of statistical tal thinking. Understand the question to be solv	ed with knowledge.	dynamics. Demonstrate	
	Fail	Little or no evidence of com	mand of knowledge of statistical thermodynan	nics and reaction dynamics.		
Course Type	Lecture	with laboratory componer	nt course			
Course Teaching	Activitie	es	Details No. of Hou			
& Learning Activities	Lectures			24		
	Laboratory			24		
	Tutorials				6	
	Reading / Self study				100	
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignn	nents	continuous assessment of on class quizzes & assignments	40	CLO 1,2,3	
	Examina	ation		60	CLO 1,2,3	
Required/recommended reading and online materials		, An introduction to Statis s, Physical Chemistry	tical Thermodynamics			
Additional Course Information	Laborato course.	ory classes are mandator	y. Students must complete ALL exp	eriments and laboratory	reports to pass this	

CHEM4542	Comput	ational chemistry (6	credits)	Academic Yea	r 2020				
Offering Department	Chemistry	/	•	Quota	50				
Course Co-ordinator	Prof G H	Chen, Chemistry (ghc@	yangtze.hku.hk)	·	'				
Teachers Involved	(Dr J Yan	(Dr J Yang, Chemistry)							
		(Prof G H Chen,Chemistry)							
Course Objectives	methods.		nputational chemistry including fir graduate and postgraduate stu tational biology.						
Course Contents	Hartree-F	ock molecular orbital n	nethod, density-functional theory	, time-dependent methods,	Basis sets, Force				
& Topics	Fields, Ql	M/MM method, free ener	gy calculation, and computer-aide	d drug design.					
Course Learning	On succe	ssful completion of this of	course, students should be able to	:					
Outcomes	CLO 1 ur	nderstand the basic cond	cepts of density-functional theory						
		nderstand the basic echanics/molecular med	numerical techniques of mol	ecular mechanics method	and quantum				
	CLO 3 er	mploy the existing com	putational software to calculate	the chemical, physical proj	perties of various				
	m	olecular systems include	e organic molecules, inorganic ma	terials and biomolecules					
Pre-requisites		HEM3541 or PHYS3351							
and Co-requisites									
and Impermissible									
combinations)									
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021 - 2	022 : N	Examination	May				
Grade Descriptors (A+ to F)	A	functional theory, open system	ledge on following topics: density-function em, molecular dynamics, force field, and contact thinking, with strong ability to apply known	uantum mechanics/molecular mech	anics. Strong analytic				
	В	dependent density-function	broad range of knowledge on following to al theory, open system, molecular dy lytical and critical abilities and logical thin	namics, force field, and quantum	mechanics/molecula				
	С	Command of knowledge on following topics: density-functional theory, Kohn-Sham equation, time-dependent density-functional theory, open system, molecular dynamics, force field, and quantum mechanics/molecular mechanics. Evidence of some analytical and critical abilities and logical thinking, with ability to apply knowledge to familiar problems in physical chemistry.							
	D	Partial but limited command of knowledge on following topics: density-functional theory, Kohn-Sham equation, time-dependent density-functional theory, open system, molecular dynamics, force field, and quantum mechanics/molecular mechanics. Evidence of some coherent analytical and critical abilities and logical thinking, with limited ability to apply knowledge to practical problems in physical chemistry.							
	Fail	dependent density-function	ommand of knowledge on following top al theory, open system, molecular dy al and critical abilities and logical thinking stry.	namics, force field, and quantum	mechanics/molecula				
Course Type	Lecture w	rith laboratory componen	t course						
Course Teaching	Activities	S	Details		No. of Hours				
& Learning Activities	Lectures				24				
Ü	Laborato	ry	lab sessions 6x4 hours of comp	utational laboratory	24				
	Tutorials				6				
	ratorialo								
		/ Self study			100				
		•	Details	Weighting in final course grade (%)	Assessment Methods				
Assessment Methods and Weighting	Reading	,	Details (continuous assessment)		Assessment				

Required/recommended reading and online materials	Attila Szabo & Neil S. Ostlund: Modern Quantum Chemistry (1st ed.) Robert G. Parr & Weitao Yang: Density-Functional Theory of Atoms and Molecules J.M. Haile: Molecular Dynamics Simulation Andrew R. Leach: Molecular Modelling - Principles and Applications	
Additional Course Information	This course is equivalent to CHEM6109 Computational Chemistry. CHEM4542 is offered every other year. Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports to pass this course.	

CHEM4543	Advance	ed physical chemis	stry (6 credits)	Academic Ye	ar 2020			
Offering Department	Chemistry			Quota	40			
Course Co-ordinator	Prof G H (G H Chen, Chemistry (ghc@yangtze.hku.hk)						
Teachers Involved	\ \	of D L Phillips,Chemistry) of G H Chen,Chemistry)						
Course Objectives			pics in physical chemistry. It is of ted in postgraduate studies.	fered for students majoring in	n physical chemistr			
Course Contents & Topics	processes	me-resolved spectroscopy methods, excited states and reactive intermediates, photophysics and photochemical ocesses, chemical reaction mechanisms, advanced quantum mechanical methods, reaction pathways and rface crossings.						
Course Learning	On succes	ssful completion of this	course, students should be able t	0:				
Outcomes	CLO 2 un	O 1 understand the basic concepts of quantum chemistry, statistical thermodynamics and molecular dynamic O 2 understand Hartree-Fock method, statistical ensembles, quantum statistics, H-theorem, and reaction dynamics						
	CLO 3 un	derstand the elementa	ary numerical procedures in Hartre	e-Fock and molecular mecha	nics methods			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Cl	HEM3541						
Offer in 2020 - 2021	Y 2nd	I sem Offer in 2021 -	2022 : Y	Examination	May			
Grade Descriptors (A+ to F)	Α							
	B Substantial command of a broad range of knowledge on following topics: variation method in quantum mechanics, Hartree-Fock method, perturbation theory, advanced statistical thermodynamics, reaction dynamics. Evidence of analytical and critical abilities and logical thinking, with ability to apply knowledge to practical problems in physical chemistry.							
	Command of knowledge on following topics: variation method in quantum mechanics, Hartree-Fock method, perturbation theory, advanced statistical thermodynamics, reaction dynamics. Evidence of some analytical and critical abilities and logical thinking, with ability to apply knowledge to familiar problems in physical chemistry.							
	Partial but limited command of knowledge on following topics: variation method in quantum mechanics, Hartree-Fock method, perturbation theory, advanced statistical thermodynamics, reaction dynamics. Evidence of some coherent analytical and critical abilities and logical thinking, with limited ability to apply knowledge to practical problems in physical chemistry.							
	Fail Little or no evidence of command of knowledge on following topics: variation method in quantum mechanics, Hartree-Fock method, perturbation theory, advanced statistical thermodynamics, reaction dynamics. Lack of analytical and critical abilities and logical thinking, with very little or no ability to apply knowledge to practical problems in physical chemistry.							
Course Type	Lecture-ba	ased course						
Course Teaching	Activities	3	Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials		tutorials/discussion		12			
	Reading /	Self study			100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments		(continuous assessment)	20	CLO 1,2,3			
	Examination		,	80	CLO 1,2,3			
Required/recommended		ns: Physical Chemistry	/		, , , , , , , , , , , , , , , , , , , ,			
reading and			ry (Prentice Hall, 4th ed.)					
online materials	R. C. Tolm	C. Tolman: The Principles of Statistical Mechanics D. Levine, R. B. Bernstein: Molecular Reaction Dynam						
Course Website	Nil		•					
Additional Course	This cours	se is also offered to RP	g students, and the course code f	or RPg students is CHEM611	2.			
			-					

CHEM4544	Electrochemical science and technology (6 credits)	Academic Year	2020				
Offering Department	Chemistry Quota 36						
Course Co-ordinator	Prof G K Y Chan, Chemistry (hrsccky@hku.hk)						
Teachers Involved	(Prof G K Y Chan,Chemistry) (Visiting Professor,Chemistry)						
Course Objectives	To understand the science of electrochemistry, methods to characterise electrochemical cells, and factors affecting electrochemical applications and technologies.						
Course Contents & Topics	Thermodynamics, kinetics, and transport of electrochemical processes. Electrochemical characterization by controlled potential, current, and hydrodynamics. Voltammetry for analytical chemistry. Electrochemical power sources, sensors, synthesis and separation processes. Electrolytes, separators, and electrode materials. Models of electrochemical processes.						
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 Understand the thermodynamic and kinetics of a charge transfer process at the electrode-electrolyte interface and transport of relevant species in molecular and macroscopic scales. CLO 2 Apply voltammetry methods to characterize an electrochemical process. CLO 3 Correlate performance of electrochemical cells to materials, design, and operation parameters.						
Pre-requisites (and Co-requisites and Impermissible	Pass in CHEM3241 or CHEM3541 or CHEM3542						

combinations)						
Offer in 2020 - 2021		offer in 2021 - 2022 : Y		Examination		
Grade Descriptors (A+ to F)	A	Demonstrate thorough knowledge of electrochemical science and technology, and mastery of skills required for attaining all of the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to solve problems in a wide range of complex, familiar and unfamiliar situations. Critical use of data and sourcing of references. Apply highly effective organizational and presentational skills.				
	В	Demonstrate substantial knowledge of electrochemical science and technology and command of skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to solve problems in familiar and some unfamiliar situations. Correct use of data and sourcing of references. Apply effective organizational and presentational skills.				
	С					
	D	attaining some of the c and critical abilities. Sh	ut limited knowledge of electrochemical scier ourse learning outcomes. Show evidence of so ow limited ability to apply knowledge to solve p effective organizational and presentational skill:	ome coherent and logical thinking problems. Limited ability to use da	, but with limited analytical	
	Fail					
Course Type	Lecture	with laboratory compo	nent course			
Course Teaching	Activities		Details	Details		
& Learning Activities	Lectures			24		
	Laboratory		Laboratory/Project	Laboratory/Project		
	Tutorials					
	Reading / Self study				100	
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignn	nents		10	CLO 1,2,3	
	Examin			50	CLO 1,2,3	
	Laboratory reports		(Laboratory or Project Report/Term Paper)	20	CLO 1,2,3	
	Test		(Test/ Quiz)	20	CLO 1,2,3	
Required/recommended reading and online materials	ISBN 97 Bard, Al	8047071045. len J., Larry R. Faulkr	and A. B. Bond, Electrochemical Scienter. Electrochemical Methods: Funda	0,7		
		780471043720.				
Additional Course Information	This cou	rse is offered every of	ther year.			

CHEM4910	Chemistry literacy and research (6 credits) Academic Year 2020						
Offering Department	Chemist	Chemistry Quota					
Course Co-ordinator	Dr X Li,	Chemistry (xiangli@hku.hk)					
Teachers Involved	(Various	s teachers in the Department, Chemistry)					
Course Objectives		urse is designed for final year students who would like to ues by working on small projects on literature research and ch		rch methods and			
Course Contents & Topics	literature	urse provides training on chemistry literature research techniq e research and a short laboratory-based research project. The lents' supervisors who are assigned by the department.					
Course Learning	On succ	cessful completion of this course, students should be able to:					
Outcomes	CLO 1	demonstrate knowledge of academic databases and search e	ngines of chemistry literatur	re			
	CLO 2	understand the terminology and nomenclature associated with	n their own research project				
		demonstrate knowledge and understanding of the chemical their own research project	techniques they used to de	o the research in			
		demonstrate knowledge and understanding of the results of the broader research area	their own research project	and its context in			
Pre-requisites (and Co-requisites and Impermissible combinations)	CHEM4. This cap	Pass in at least 24 credits of advanced level disciplinary core/elective chemistry courses (CHEM3XXX or CHEM4XXX) in the Chemistry Major including CHEM3241, and CHEM3341, and CHEM3441, and CHEM3541. This capstone course is for Chemistry Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.					
Offer in 2020 - 2021	Y 2	nd sem Offer in 2021 - 2022 : Y	Examination	No Exam			
Grade Descriptors (A+ to F)	A	Show an extensive comprehension of the research project. Demonstrate some originality. Illuminating utilization and critical analysis / evaluation sources. Critical employment of data and results to synthesize appropria of a wide range of appropriate theories, principles, data and methods. skills. [Work of A+ should demonstrate substantial additional work beyon	of information acquired from a wid- ate and illuminating conclusions. De Employ very effective organization	e range of high quality emonstrate integration nal and presentational			
	В	Show a substantial comprehension of the research project. Demonstrate able analytical and critical thinking with use of relevant information from sources. Demonstrate ability to compose meaningful comparisons between different secondary interpretations. Correct utilization of data and results to form appropriate conclusions. Compose general integration of theories, principles, data and methods. Perform effective organizational and presentational skills.					
	С	Show a general but incomplete comprehension of the research project. Presence of some analytical and critical thinking with use of relevant information from sources. Demonstrate ability to compose comparisons between different interpretations. Mainly correct but some incorrect utilization of data and results to form appropriate conclusions. Demonstrate some partial integration of theories, principles, data and methods. Perform moderately effective organizational and presentational skills.					
	D Show a partial but limited comprehension, with knowledge of some relevant information, of the research project. Presence of some coherent and logical thinking, but with limited analytical and critical abilities. Show utilization and reference of several sources, but mostly via summary instead of by analysis and comparison. Limited ability to employ data and results to form appropriate conclusions. Demonstrate limited integration of theories, principles, data and methods. Perform limited or marginally effective organizational and presentational skills.						
	Fail Show little or no comprehension of the research project. Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Limited employment of secondary sources and no critical comparison of them. Incorrectly utilize data and results and/or unable to form appropriate conclusions. Demonstrate little or no integration of theories, principles, data and methods. Organization and presentational skills are of very limited use or ineffective.						
		methods. Organization and presentational skills are of very limited use of	r ineffective.				

Course Teaching	Activities Reading / Self study Details 12 hrs tutorials; 46 hrs of workshops and 100 hrs reading/self study		No. of Hours			
& Learning Activities			158			
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Oral presentation		50	CLO 1,2,3,4		
	Research report		50	CLO 1,2,3,4		
Required/recommended reading and online materials	Reading materials will be assigned	d depending on the project.				
Additional Course Information	Satisfactory completion of this cou	atisfactory completion of this course will be counted towards the Capstone requirement.				

CHEM4911		ne experience for ia (6 credits)	chemistry undergraduates:	Academic Yea	r 2020		
Offering Department	Chemistry	,		Quota			
Course Co-ordinator	Dr A P L 1	Γong, Chemistry <i>(apl</i>	ltong@hku.hk)				
Teachers Involved	(Various t	eachers in the Depa	rtment,Chemistry)				
Course Objectives	students with that he in classro	This project-based course with the theme of Chemistry for a Better Living in a Foreseeable Future aims to provide students with a capstone experience. It aims to enable students to think what are the key issues the world is facing with that have to be solved by chemistry and related technology. Students will need to apply what they have learnt in classroom and conduct literature search regarding advanced chemistry research and related technology under development to solve the problems identified in their project using various channels.					
Course Contents & Topics	No formal teaching. It is expected that students are actively engaged and should devote 120-140 hours to working on this project. Students will work in groups of two or three, under the supervision of the course coordinator. The duration of the project will be two to three months. The time of running this project-based course is in the summer (May - August).						
Course Learning			nis course, students should be able to:		() 0 ,		
Outcomes	CLO 3 wo	CLO 1 observe and evaluate the various issues we are facing with and determine ways in which chemistry can be used to solve the problems CLO 2 integrate theory and practice, and to understand limitations of their current knowledge CLO 3 work in a team and to collaborate with people with different background CLO 4 express scientific ideas effectively in both written and oral forms CLO 5 develop further logical, critical thinking and creativity					
			appreciation for chemistry as to its releva	•			
Pre-requisites (and Co-requisites and Impermissible combinations)	Students are expected to have satisfactorily completed all introductory chemistry disciplinary core courses and at least 24 credits of advanced level disciplinary core/elective chemistry courses in the Chemistry Major. Students who are interested in taking the course should contact the course coordinator for application in April - May. Late application may not be considered. This capstone course is for Chemistry Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.						
Offer in 2020 - 2021		nmer Offer in 2021	•	Examination	No Exam		
Grade Descriptors	A		grasp of the subject. Show strong analytical and				
(A+ to F)	to quote/reference aptly. Critical use of data and results to draw appropriate and insightful conclusions. Show integration of the full range of appropriate theories, principles, evidence and techniques. Apply highly effective organizational and presentational skills. [Work of A+ should show considerable additional work beyond that is required in wider areas relevant to the topic.] B Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly. Correct use of data of results to draw appropriate conclusions. Show general integration of theories, principles, evidence and techniques. Apply effective organizational and presentational skills. C Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Use of relevant information from sources, showing ability to make comparisons between different interpretations and to quote/reference aptly. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Show some partial integration of theories, principles, evidence and techniques. Apply moderately effective organizational and presentational skills.						
	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Demonstrate use and reference of several sources, but mainly through summary rather than analysis and comparison. Limited ability to use data and results to draw appropriate conclusions. Show limited integration of theories, principles, evidence and techniques. Apply limited or barely effective organizational and presentational skills.						
	Fail Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Limited use of secondary sources and no critical comparison of them. Misuse of data and results and/or unable to draw appropriate conclusions. Show little or no or inapt integration of theories, principles, evidence and techniques. Organization and presentational skills are minimally effective or ineffective.						
Course Type		sed course	In the Paris				
Course Teaching & Learning Activities	Activities		Details		No. of Hours		
a Leanning Activities		vith supervisor	Tutorials		10		
		Self study	Croup work or project		60		
	Assessm		Group work or project		70		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Oral presentation		40% Presentation; 10% Participation; 10% Peer evaluation	60	CLO 1,2,3,4,5,6		
	Research	report		40	CLO 1,2,4,5,6		
Required/recommended reading and online materials	No specific list of textbooks and references. Students are encouraged to obtain information via various channel (main library, e-journals, internet, and discussions with classmates and teachers, etc.).						
Additional Course Information			it conducted via the online course selection office after approval has been obtained fro	•	•		

CHEM4966	Chemistry	internship (6 cred	dits)	Academic Yea	r 2020		
Offering Department	Chemistry		•	Quota			
Course Co-ordinator	Dr H Y Au-Y	Dr H Y Au-Yeung, Chemistry <i>(hoyuay</i> @ <i>hku.hk)</i>					
Teachers Involved	(Dr H Y Au-Y	'eung,Chemistry)					
Course Objectives	study. The v	workplace learning execution study to the real work	the opportunities to gain work expense the properties the special benefits the environments. Students have to ide the University arranged by the Students have to be special benefits the special bene	its to the students to app take on at least 160 hours	ly their knowledge		
Course Contents & Topics	 Within the various tasks Outside the be supervise Department/ 	Within the University: The student will be supervised by a staff member (Supervisor), working on a project or various tasks as instructed by the Supervisor. Outside the University: The student will work in an external agency related to the major of study. The student will be supervised under a staff member of the external agency (the External Supervisor) and a staff member of the Department/School of the student (the Internal Supervisor). The work to be performed by the student will normally be instructed by the External Supervisor, with prior agreement of the Internal Supervisor.					
Course Learning			course, students should be able to:				
Outcomes			major study in solving practical pro				
	-		erience in the industry related to the				
Pre-requisites (and Co-requisites and Impermissible combinations)	CHEM4XXX This capston) in the Chemistry Maj e course is for Chemi	advanced level disciplinary core/e jor. istry Major/ Chemistry Major (Intensi red to take this capstone course is the	ive) students only.	s (CHEM3XXX or		
Offer in 2020 - 2021			ner Offer in 2021 - 2022 : Y	Examination	No Exam		
Grade Descriptors (Pass /Pass with distinction /Fail)	Distincti on Pass	performance in handling effective collaboration ar requirements set out in th and excellent evaluation be Able to apply knowledge	to solve problems in the workplace. Success	e job or assigned by supervisor agues, and clients in the job. s rs, with excellent performance in fully handles and carries out the	 (s). Establishes highly Successfully fulfills the written and oral report, work required in the job 		
	Fail	clients in the job. Success oral report, and evaluati awarded a grade of "Distin Very limited or no ability	to solve problems in the workplace. Fails	Course Description regarding wo strating excellent performance in to handle or carry out the work	rking hours, written and in the above would be required in the job or		
	assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other colleagual clients in the job. Fails to satisfy the requirements set out in the Course Description regarding working hours, written an report, or evaluation by supervisor(s), etc.						
Course Type	Internship						
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Internship w	ork	it is expected that students are to (or the equivalent of 4 weeks full-ti		160		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Written report		written report, employer's feedback and oral presentation	100	CLO 1,2		
Additional Course Information	be recorded interested to Enrolment of	on the student's tra enrol in this course sl this course is not co	urse can be counted towards the Canscript. This course will be assess hould contact the Department to obtain nducted via the online course selection after approval has been obtained from the course selection.	sed on "Pass/Fail" basis. ain the approval. tion system and should be	Students who are made through the		

CHEM4999	Chemistry project (12 credits)	Academic Year	2020				
Offering Department	Chemistry	Quota					
Course Co-ordinator	Dr J Y Tang, Chemistry (jinyao @hku.hk)						
Teachers Involved	(Various teachers in the Department, Chemistry)						
Course Objectives		To provide experience of research techniques by working on a short project under the direct supervision of a member of staff. This course would prepare students for graduate school work in chemistry.					
Course Contents & Topics	A short research project provided by a member of staff (e.g. the students supervisor).						
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 understand the terminology and nomenclature associated with the	neir own research chemist	ry project				
	CLO 2 demonstrate knowledge and understanding of the chemical techniques they used to do the research in their own chemical project						
	CLO 3 demonstrate critical thinking skill in their own research project and understanding the motivation and target of the research						
	CLO 4 demonstrate knowledge and understanding of the results of their own chemistry project and its context in the broader research area						
	CLO 5 demonstrate ability to integrate the knowledge acquired from previous courses and develop fundamental knowledge of designing research plan						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in at least 24 credits of advanced level disciplinary core/elective chemistry courses (CHEM3XXX or CHEM4XXX) in the Chemistry Major including CHEM3241, and CHEM3341, and CHEM3441, and CHEM3541. This capstone course is for Chemistry Major/ Chemistry Major (Intensive) students only. The earliest that a student is allowed to take this capstone course is their year 3 study.						
Offer in 2020 - 2021	Y Year long Offer in 2021 - 2022 : Y	Examination	No Exam				
Grade Descriptors (A+ to F)	A Show an extensive comprehension of the research project. Demonstrate ve some originality. Illuminating utilization and critical analysis / evaluation of i sources. Critical employment of data and results to synthesize appropriate of a wide range of appropriate theories, principles, data and methods. Em skills. [Work of A+ should demonstrate substantial additional work beyond the	nformation acquired from a wide and illuminating conclusions. De ploy very effective organization nat is required in wider areas rele	range of high quality monstrate integration al and presentational evant to the topic.]				
	B Show a substantial comprehension of the research project. Demonstrate able analytical and critical thinking with use of relevan information from sources. Demonstrate ability to compose meaningful comparisons between different secondary interpretations. Correct utilization of data and results to form appropriate conclusions. Compose general integration of theories, principles, data and methods. Perform effective organizational and presentational skills.						
	C Show a general but incomplete comprehension of the research project. Pre-	sence of some analytical and cri	tical thinking with use				

	D	correct but some incorrect u theories, principles, data and Show a partial but limited of some coherent and logical sources, but mostly via sur	n sources. Demonstrate ability to compose tilization of data and results to form appropria d methods. Perform moderately effective orgatomprehension, with knowledge of some relatinking, but with limited analytical and crit mmary instead of by analysis and comparismonstrate limited integration of theories, prin presentational skills.	ate conclusions. Demonstrate s anizational and presentational s evant information, of the resea ical abilities. Show utilization a ion. Limited ability to employ of	ome partial integration of kills. rch project. Presence of and reference of several data and results to form	
	Fail	Show little or no comprehension of the research project. Evidence of little or lack of analytical and critical abili coherent thinking. Limited employment of secondary sources and no critical comparison of them. Incorrectly results and/or unable to form appropriate conclusions. Demonstrate little or no integration of theories, princ methods. Organization and presentational skills are of very limited use or ineffective.				
Course Type	Project-ba	sed course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Reading / Self study		8 hours per week for 24 weeks or longer discussions & meetings		192	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Dissertation		including a written report and an oral presentation	100	CLO 1,2,3,4,5	
Required/recommended reading and online materials	Specialist	pecialist texts dependant on the selected topic.				
Additional Course Information	Third year	ird year students with exceptional academic achievement may also apply for this course				

CSCI9001	Practica	Practical Chinese for science students (6 credits) Academic Yea						
Offering Department	Chinese			Quota				
Course Co-ordinator	Mr K W W	long, Chinese (kwwongt	@hku.hk)					
Teachers Involved	(Dr K T La (Dr S F La	Dr C M Chan,Chinese) Dr K T Lam,Chinese) Dr S F Lee,Chinese) Mr K W Wong,Chinese)						
Course Objectives	students announce	his course aims to enhance the students' competence using Chinese for professional communication. It helps the tudents to master the techniques of writing different types of documents such as memos, emails, letters, nnouncements, notice, brochures, leaflets, and reports. In addition, topics addressing resentation and discussion echniques, the style and rhetoric of reader-based writings are included to heighten the students' linguistic ensitivity						
Course Contents & Topics	good-new electronic	Grammar & vocabulary of modern Chinese - The Chinese writing system - Techniques of writing short messages: ood-news and goodwill messages, bad-news messages, and persuasive messages - Techniques of writing lectronic documents: emails; presentations - Styles and rhetoric of reader-based reports, proposals and resentations						
Course Learning	On succes	ssful completion of this c	course, students should be able to:					
Outcomes			etency in modern Chinese and write v					
			and stylistics, as well as practical wri					
	CLO 4 ap	pply their disciplinary kno	nmunication, initiate discussions and owledge and their Chinese writing ski	ls and professional prese				
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL	analytically, critically and creatively in different social or professional discourses NIL						
Offer in 2020 - 2021	Y 1st	sem 2nd sem Offer	in 2021 - 2022 : Y	Examination	Dec May			
Grade Descriptors (A+ to F)	A The student acquired a superb ability to achieve the intended learning outcomes of the course at all levels of learning: describe, apply, evaluate, and synthesize the language techniques for effective communication in all situations. The student acquired the ability to achieve the intended learning outcomes of the course at all levels of learning: describe, apply, evaluate, and synthesize the language techniques for effective communication in most situations. The student acquired adequate ability to achieve the intended learning outcomes of the course at low levels of learning (i.e. describe and apply the language techniques for effective communication) but not at high levels of learning (i.e. evaluate and synthesize the language techniques for effective communication). The student only has basic familiarity with the subject.							
	Fail	The student has very limited	I familiarity with the subject.					
Course Type	Lecture-ba	ased course						
Course Teaching	Activities	S	Details		No. of Hours			
& Learning Activities	Lectures			12				
	Tutorials		Small group tutorials		12			
	Group wo	ork	Workshops	24				
	Discussio			24				
		/ Self study	Reading/self study (20 hours) and preparation (12 hours)		32			
	Assessm				16			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments		Self-access & online exercises (40%) and Tutorial disscussion (10%)	50				
	Examination			50				
Required/recommended reading and online materials	港:香港 錫韋复·1 務印書館 意:寫作篇	· · ·						

EASC1020	Introdu	iction to climate sci	ience (6 credits)	Academic Ye	ar 2020		
Offering Department	Earth Sc			Quota			
Course Co-ordinator	Dr Z H L	iu, Earth Sciences (zhlid	u @hku.hk)				
Teachers Involved		Dr S H Li,Earth Sciences) Dr Z H Liu,Earth Sciences)					
Course Objectives	controls geologic	This course provides an introduction to the study of global climate systems and climate change. We study the controls of temporal and spatial variations in earth's climate and its histories of past climates preserved in the geological record. We look at modern research methods that are used in paleoclimatic and paleoenvironmental reconstructions.					
Course Contents & Topics	geologic	Global climatic systems, climate classification, natural variability of climate, physical causes for changes through geologic time, external and internal forcing mechanisms, solar orbital variations, major climatic events of the past and their effects on how our planet has developed, glacial and interglacial oscillations, predicting future global					
Course Learning		essful completion of this	s course, students should be al	ole to:			
Outcomes	CLO 1	· · · · · · · · · · · · · · · · · · ·	s of climatology and approache				
	CLO 2		nd physical processes controllir	ů ,			
	CLO 3		g forces of Earth's climate cha	. ,			
	CLO 4		of Earth's climate change	3			
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL						
Offer in 2020 - 2021	Y 2r	nd sem Offer in 2021 -	- 2022 : Y	Examination	May		
Grade Descriptors (A+ to F)	A	learning outcomes. Show knowledge to a wide rang appropriate and insightfu	v strong critical abilities and logical t ge of complex, familiar and unfamiliar	nsive knowledge and skills required for thinking, with evidence of original though situations. Demonstrate critical use of on the critical analysis / evaluation of inform	ht, and ability to apply data and results to drav		
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate correct use of data and results to draw appropriate conclusions. Show critical use of relevant information from sources and ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Demonstrate mostly correct but some erroneous use of data and results to draw appropriate conclusions. Show use of relevant information from sources and ability to make comparisons between different interpretations and to quote/reference aptly.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Demonstrate limited ability to use data and results to draw appropriate conclusions. Show use and reference of several sources, but mainly through summary rather than analysis and comparison.					
	Fail	Demonstrate little or no e of analytical and critical problems. Demonstrate	vidence of command of knowledge ar abilities, logical and coherent thinki	d skills required for attaining the course ng. Show very little or no ability to appunable to draw appropriate conclusions	oly knowledge to solv		
Course Type	_	based course					
Course Teaching	Activitie	es	Details		No. of Hours		
Learning Activities	Lectures	3			36		
	Tutorials				12		
	Project work				36		
	Reading	j / Self study			50		
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mappin		
	Assignm	nents		50	CLO 2,3		
	Examina			50	CLO 1,2,3,4		
Required/recommended reading and online materials		Ruddiman, W. F.: Earth's Climate Past and Future (W. F. Freeman, 2008, 2nd edition) Robert V. Rohli and Anthony J. Vega: Climatology (Jones and Bartlett Publishers, 2008)					

EASC1401	Blue Planet (6 credits)	Academic Year	2020			
Offering Department	Earth Sciences	Quota				
Course Co-ordinator	Dr P Bach, Earth Sciences (pabach@hku.hk)					
Teachers Involved	(Dr P Bach,Earth Sciences)					
Course Objectives	The aim is to provide those students who are taking a first course in Earth System Sciences with a fundamental knowledge of how our diverse and living planet Earth works with weaving together an understanding of the dynamic and interactive processes in the Earth's lithosphere, hydrosphere, biosphere and atmosphere. In addition, students should become familiar with the way the study of Earth Sciences blends observation, information, hypothesis, communication and decision making for a better understanding of the future of our planet.					
Course Contents	This introductory course will introduce and discuss the following topic	s:				
& Topics	Introduction to Earth Systems and Habitable Planet Earth, - Lithosphere (Earth Materials, Plate Tectonics, Volcanism, Earthquakes, Surface Processes and Rock Cycle) - Hydrosphere (Surface- and Groundwater, Oceans and Water Cycle) - Atmosphere (Composition, Weather, Climate, Green House Effect, Oxygen Cycle) - Biosphere (Life, Ecosystems, Evolution and Extinction, Geochemical Cycles, - Concepts and Evolution of Dynamic Earth Systems, Human Interactions with Planet Earth (Earth Resources, Geological Hazards, Climate Change, Human Impact and Environmental Changes)					
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 understand the terminology and nomenclature appropriate to the introductory study of Earth Sciences					
	CLO 2 demonstrate knowledge and understanding of the underlying concepts associated with the study of the Earth Systems and their dynamic interactive processes					
	CLO 3 understand the extent and nature of global change and enviro	onmental concerns around us	3			
	CLO 4 demonstrate the ability to make and record observations of	on Earth Systems processes	s in natural field			

	е	nvironments					
	CLO 5 develop skills to synthesize observation and knowledge in a report in essay form						
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL						
Offer in 2020 - 2021	Y 1st	t sem 2nd sem Offe	r in 2021 - 2022 : Y	Examinatio	n Dec May		
Grade Descriptors (A+ to F)	Α	Demonstrate thorough mastery of extensive knowledge / competencies/skills at an Earth Science introductory level required for attaining most or all of the course learning outcomes. Shows clear understanding of introductory terminology and concepts and strong abilities to apply and relate them in a range of complex interactive processes between Earth Systems. Demonstrates highly effective observational skills in field as well as organizational skills to present important observations made and uses them to draw appropriate and insightful conclusions with an impressive level of depth and original thoughts.					
	В						
	C Demonstrate general but incomplete command of knowledge / competencies/skills at an Earth Science introductory level required for attaining most of the course learning outcomes. Shows evidence for some understanding of introductory terminology and concepts and some abilities to apply and relate them in some interactive processes between Earth Systems. Demonstrates moderately effective observational skills in field as well as organizational skills to present observations made mostly correct but with some erroneous use and results to draw appropriate conclusions.						
	D Demonstrate partial but limited command of knowledge / competencies/skills at an Earth Science introductory level required for attaining some of the course learning outcomes. Shows evidence of limited understanding of introductory terminology and concepts and limited abilities to apply and relate them in some interactive processes between Earth Systems. Demonstrates limited observational skills in field. Applies limited or barely effective organizational and presentational skills to present observed details and facts correctly. Limited ability to draw appropriate conclusions.						
	Fail	for attaining the course I concepts and little or no a observational skills in field	idence of command of knowledge / compete earning outcomes. Shows little or no evit bilities to apply and relate them in interactiv . Applies incoherent organizational and poo le to draw appropriate conclusions.	dence of understanding of into we processes between Earth Sy	oductory terminology and estems. Demonstrates poo		
Course Type	Lecture w	vith laboratory compone	nt course				
Course Teaching	Activitie	S	Details		No. of Hours		
& Learning Activities	Lectures				24		
	Laborato	,			24		
	Field wor		Compulsory 2-day field camp		16		
	Reading	/ Self study			100		
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examina	ition		40	CLO 1,2,3		
	Laborato	ory reports		20	CLO 1,2,4		
	Project report		Field project report and field note book	30	CLO 1,2,3,4,5		
	Test		Online Quizzes	10	CLO 1,2,3		
Required/recommended reading and online materials		3.J and Murck B.W. : Th B and Damian N.: Earth	` ,				

EASC1402	Principle	s of geology (6 credits)	Academic Ye	ar 2020
Offering Department	Earth Scie	nces	Quota	
Course Co-ordinator	Prof M Sur	n, Earth Sciences (minsun@hku.hk)		
Teachers Involved	(Dr M C Cl	g,Earth Sciences) neung,Earth Sciences) n,Earth Sciences)		
Course Objectives	This cours	e is an introduction to fundamental principles ar	nd concepts in geology.	
Course Contents & Topics	- Earth's formation, history and geological time scale - Rocks and rock cycle - Plate tectonics: a unifying theory - Earthquakes and Earth's interior - Igneous processes and igneous rocks - Geomorphology and surficial processes - Sedimentary rocks - Folds, Faults and Metamorphism - Metamorphic rocks - Principles of stratigraphy; stratigraphic dating methods - Biostratigraphic methods; fossils and index fossils - Radiometric dating methods			
Course Learning Outcomes	CLO 1 rd CLO 2 d CLO 3 e CLO 4 d	sful completion of this course, students should ecite the rock cycle and the rock material in the escribe the overall structure of the earth and the xplain the major geological phenomena in the cescribe the methods in geological dating ame the major events in earth's history	earth's crust e key external and internal processes	3
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL	,		
Offer in 2020 - 2021	Y 1st s	sem Offer in 2021 - 2022 : Y	Examination	Dec
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advanced level of learning outcomes. Show strong analytical and critical ab to apply knowledge to a wide range of complex, familia presentational skills.	oilities and logical thinking, with evidence of or	ginal thought, and ability
	В	Demonstrate substantial command of a broad range of k	knowledge and skills required for attaining at	least most of the course

		learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.			
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to mos familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.			
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lac of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.			
Course Type	Lecture w	ith laboratory componer	nt course		
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures		12 sessions x 2 hours		24
	Laboratory		laboratory practical on rocks and minerals, earthquakes, fossil identification		16
	Field work		1 field trip	1 field trip	
	Group work		1 group project with presentation		4
	Reading / Self study				100
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Examina	tion	2-hour written exam	40	CLO 1,2,3,4,5
	Laboratory reports		Practical/field reports	40	CLO 1,2,3,4,5
	Project report		Presentation and report	20	CLO 1,2,3,4,5
Required/recommended reading and online materials	Tarbuck E	E.J. and Lutgens F.K.: TI	he Earth: An Introduction to Ph	ysical Geology (latest edition)	

EASC1403	Geolog	ical heritage of I	Hong Kong (6 credits)	Academic Y	ear 2020		
Offering Department	Earth Sci		,	Quota	35		
Course Co-ordinator	Prof M F	Prof M F Zhou, Earth Sciences (mfzhou@hku.hk)					
Teachers Involved	(Dr M C Cheung,Earth Sciences) (Prof M F Zhou,Earth Sciences)						
Course Objectives	To give an overview of the geology of Hong Kong, potential geological resources for tourism and the role of geology in the development of Hong Kong's infrastructure.						
Course Contents & Topics	6 Lectures on general geology of Hong Kong, geology of Hong Kong's Country Parks, and aspects of geological knowledge pertaining to large scale construction project plus at least 4 weekend field trips (equivalent to a total of 32 hours) guided by experts to localities of geological interest.						
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 a	cquire an appreciati	on of the processes leading to the form	ation of various landforms	3		
	CLO 2 d	emonstrate underst	anding of the major morphological featu	res in Hong Kong			
	CLO 3 e	nhance the observa	tion and analytical skills, and physical a	bility through participation	n in the field excursion		
	CLO 4 u	nderstanding the dif	ferent impacts on / importance of geolo	gical heritage of Hong Ko	ng		
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL						
Offer in 2020 - 2021	Y 2n	d sem Offer in 202	21 - 2022 : Y	Examination	n May		
Grade Descriptors (A+ to F)	A Demonstrate thorough understanding at an advanced level of extensive knowledge and skills with evidence for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking. Evidence of original thoughts, excellent field observation and ability to solve problems. Highly effective organization and presentation skills.						
	В	Demonstrate substantial understanding at an advanced level of extensive knowledge and skills with evidence for attaining course learning outcomes. Show analytical and critical abilities and logical thinking. Evidence of original thoughts and abilities and logical thinking. Evidence of original thoughts and abilities and logical thinking.					
	С	Demonstrate general but incomplete understanding required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking. Moderately effective organization and presentation skills.					
	D	Demonstrate partial but limited understanding for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail No or little knowledge about the subject. No evidence for attaining the course learning outcomes. Lack of analytical and criting abilities, logical and coherent thinking. Very little or no ability for field observation and for solving problems. Poor organizational skills.						
Course Type	Lecture-b	pased course					
Course Teaching	Activitie	s	Details	Details			
& Learning Activities	Lectures		6 sessions x 2 hours	12			
	Field wo	rk	4 field trips	32			
	Group w		1 presentation and report	20 60			
		/ Self study					
	Assessment		1 essay		20		
Assessment Methods and Weighting	Methods	5	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		attendance of compulsory guided field trips	15	CLO 1,2,3,4		
	Essay		1 individual essay	20	CLO 1,2,3,4		
	Examina	ition	2-hour written examination	40	CLO 1,2,4		
	Presenta	ation	1 group presentation	15	CLO 1,2,3,4		
	Project report		1 group project	10	CLO 1,2,3,4		

EASC1404	Early life on earth (6 credits)	Academic Year	2020
Offering Department	Earth Sciences	Quota	50

Course Co-ordinator	TBC, Earl	th Sciences ()				
Teachers Involved						
Course Objectives	This course focuses on the origins of life. It provides an overview of Earth's early environments, how life is thought to have originated on Earth, and how the Earth's dynamic environment impacted the origin of life. This course will also provide a basic overview of habitable environments on Earth and elsewhere in the Solar system.					
Course Contents & Topics	This course will cover the following topics: the composition and properties of the early Earth and Earth's first oceans; the central role of water in life; abundance of biological elements on the early Earth and elsewhere in the Solar system; possible conditions for the synthesis of life's first building blocks; the (geo)chemical roots of early life on Earth and the search for life's signatures in the solar system and beyond.					
Course Learning			course, students should be able to:	,		
Outcomes	CLO 2 ex	xplain and describe the nolecules	al and chemical conditions on the extreme geocher role of water and extreme geocher ifferent geological environments pla	mical conditions in the syr		
	CLO 4 id	entify challenges associa	ated with each step in the origins of	life		
	CLO 5 in	vestigate a current origir	ns of life topic			
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL					
Offer in 2020 - 2021	N Off	fer in 2021 - 2022 : N		Examination		
(A+ to F)	B C D	course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and apply his/her knowledge to a range of problems in the field of the "origins of life", and at the same, is capable to combine knowledge from the natural science: to better understand potential early Life processes on Earth and elsewhere. Student shows the ability to apply effective organizational and presentational skills. Student demonstrates general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply his/her knowledge to a range of problems in the field of the "origins of life". Student shows the ability to apply moderately effective organizational and presentational skills.				
	Fail	outcomes. Lack of analytica	or no evidence of command of knowledged and critical abilities, logical and coherent t	hinking. Shows very little or no a	bility to apply knowledge	
Course Type	Lecture w	vith laboratory componen	elated to the origins of life. Organization and t course	i presentational skills are mimilia	ny enective or menective.	
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				24	
-	Laborato	ry			24	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents	1 midterm, group presentations, short-essay	60		
	Examinat	tion	2-hour written examination	40		
Required/recommended reading and online materials	K.W. Plax	co & M. Gross: Astrobio	nical Evolution (Oxford University P logy: A brief Introduction (J. Hopkin oduction to Astrobiology (Cambrid	s University Press, 2006)		

EASC1405	Peaceful use of nuclear technologies (6	credits) Aca	demic Year	2020			
Offering Department	Earth Sciences	Quo	ota				
Course Co-ordinator	Dr S H Li, Earth Sciences (shli@hku.hk)						
Teachers Involved	(Dr S H Li,Earth Sciences)						
Course Objectives		To provide students with the science backgrounds and knowledge on application of nuclear technologies in daily life and to invoke an awareness of current applications of nuclear sciences by case studies.					
Course Contents & Topics	engineering, biological, physical and social scie	Man and radiation; principles of nuclear technology; case studies of nuclear techniques applied in arts, engineering, biological, physical and social sciences; radiation on earth and beyond; industrial application of nuclear techniques; nuclear techniques in medical study. Future development in nuclear technologies.					
Course Learning	On successful completion of this course, students	should be able to:					
Outcomes	CLO 1 recognize the science fundamentals in nuclear technologies						
	CLO 2 explain and describe the principles of nuclear technologies applied						
	CLO 3 have the awareness of current applications of nuclear sciences						
	CLO 4 demonstrate the knowledge and understanding of the underlying concepts associated with nuclear technologies						
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL						
Offer in 2020 - 2021	N Offer in 2021 - 2022 : N	Exa	mination				
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	Demonstrate general but incomplete comman	of knowledge and skills required for att	taining most of	the course learning			

	С		of some analytical and critical abilities a oderately effective organizational and pres		apply knowledge to most	
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcome. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to app knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to s problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures			36		
	Tutorials				12	
	Field work				6	
	Group work			6		
	Project work				6	
	Reading / Self study				92	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents	Group activities and reports	30	CLO 1,2,3	
	Examinat	ion	2-hour	50	CLO 1,2,4	
	Project reports		Individual Report	20	CLO 1,3,4	
Required/recommended reading and online materials	To be ann	ounced				

EASC1406	Introduc	tion to the earth-life	system (6 credits)	Academic Ye	ar 2020		
Offering Department	Earth Scie	nces		Quota			
Course Co-ordinator	Dr S Crow	Dr S Crowe, Earth Sciences (sacrowe@hku.hk)					
Teachers Involved	(Dr S Crowe,Earth Sciences)						
Course Objectives	This course provides students with an introduction to the biosphere, including physical, chemical, geological and biological interpretations on the co-evolution of the biosphere, atmosphere, hydrosphere and geosphere through deep geological time, the current Earth-Life interactions with the influence of human beings and the future of the Human-Earth system.						
Course Contents & Topics	A habitable planet; the carbon cycle; plate tectonics, climate and life; mountains and climate change; the emergence and persistence of life; life in the Phanerozoic; the Earth at extremes; the future of the Human-Earth system						
Course Learning Outcomes		derstand the coevolutio	ourse, students should be able to not the inanimate world and the		gh deep geological		
		plain why the Earth is a					
			process as an agent of the mode				
			nd understanding of the natural				
			tions related to systematic struct	ure and evolution of the Earth	-life system		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	ASC1401					
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	022 : Y	Examination	No Exam		
Grade Descriptors (A+ to F)	В	Demonstrate thorough and complete grasp of the subject in order to fulfil most or all learning outcomes. Show clea understanding of the connections between the geosphere, hydrosphere and biosphere of the modern Earth and in the geologica past. Able to understand the interactions between human beings and the nature only happens as the latest processes on Earth. Demonstrate understanding at an advanced level of extensive knowledge and skills with evidence for attaining all the cours learning outcomes. Show understanding of the connections between the geosphere, hydrosphere and biosphere of the moder Earth and in the geological past. Can demonstrate the interactions between human being and the nature only happen in the					
	С	latest geological time. Demonstrate general but incomplete understanding required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking. Moderately effective organization and presentation skills.					
	D	Demonstrate partial but limited understanding for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to solve problems. Apply limited or barely effective organizational and presentational skills. Get no or little knowledge about the subject. No evidence for attaining the course learning outcomes. Lack of analytical and					
	Fail	critical abilities, logical and oskills.	about the subject. No evidence for atta coherent thinking. Very little or no ability				
Course Type	1	ased course					
Course Teaching	Activities	;	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading /	Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	nts		80	CLO 1,2,3,4,5		
	Test		One in-class examination	20	CLO 1,2,3,4,5		
Required/recommended reading and online materials	C. Cockell Press, 200		ls and N. Harris: An Introduction	n to the Earth-Life System (C	ambridge University		

EASC1407	Dinosaur Ecosystems (6 credits)	Academic Year	2020
Offering Department	Earth Sciences	Quota	
Course Co-ordinator	Dr M Pittman, Earth Sciences (mpittman@hku.hk)		
Teachers Involved	(Dr D Pol,Museo Paleontologico Egidio Feruglio)		

	,	man,Earth Sciences) LInstitute of Vertebrate	e Paleontology and Paleoanthropo	ology)			
Course Objectives	*	This course aims to introduce:					
-	-Dinosaur biology						
	-How palaeontologists reconstruct ancient ecosystems using fossil and modern evidenceTraits and significance of a Late Cretaceous ecosystem.						
		•	cific aims, the course style and str	ucture incorporating e-learnin	g tools is specifically		
	designed	to encourage the dev	velopment of analytical skills as es to apply newly acquired knowle	well as critical, logical and I	•		
Course Contents		se covers five topics:	oo to apply homy acquired interns	ougo.			
& Topics		ction to dinosaurs:					
			n their appearance, classificatio field site visited and discussed in				
		Gobi Desert of China.	neid site visited and discussed in	the course. Late Cretaceous	s site of Lilian in the		
	2. Meat-ea	ating dinosaurs - thero	pods:				
			including their biology and insight		em.		
		•	opodomorph and ornithischian din e sauropodomorph dinosaurs to th		nithischian dinosaur		
			n ornithischians. Insights into he				
	ecosysten						
	_	vith dinosaurs: saurian rentiles, mamn	nals, fish and invertebrates that li	ved with the dinosaurs of Erli	an and their roles i		
		pecosystem.	nais, non and invertebrates that if	ved with the difference of Em			
		-	ecosystems to life - diet, behaviou	r and growth:			
Course Learning			o bring dinosaurs to life. s course, students should be able	to			
Outcomes		•	use the terminology covered.	ιο.			
-		•	inosaur biology and demonstrate	e understanding of it in fam	iliar and unfamiliar		
		tuations.					
			ntologists reconstruct ancient eco		odern evidence and		
	show understanding of it in familiar and unfamiliar situations. CLO 4 Recall the traits and significance of the Late Cretaceous ecosystem of Erlian and compare and contrast						
		Erlian with other contemporaneous ecosystems.					
Pre-requisites	NIL						
(and Co-requisites and Impermissible							
combinations)							
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 -	- 2022 : Y	Examination	May		
Grade Descriptors	Α		astery of the knowledge and skills require				
(A+ to F)	analytical abilities and strong critical and logical thinking. Evidence of lateral thinking and original thought. Ability to apply knowledge to a wide range of complex situations, both familiar and unfamiliar.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of good analytical abilities and good critical and logical thinking. Rare instances of lateral						
	thinking and original thought. Ability to apply knowledge to familiar situations and some unfamiliar situations.						
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical abilities and some critical and logical thinking. Ability to apply knowledge to most						
		familiar situations.					
		D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcome. Show evidence of some coherent and logical thinking, but only limited analytical abilities and limited critical thinking. Show limited analytical abilities are limited critical thinking.					
	Fail	ability to apply knowledge		ca analytical abilities and limited criti			
	I all	Demonstrate little or no c	to solve problems.		cal thinking. Show limited		
		abilities and lack of critical		for attaining the course learning out	cal thinking. Show limited comes. Lack of analytica		
Course Type	Lecture wi	abilities and lack of critical problems.	to solve problems. ommand of knowledge and skills required al thinking, logical thinking and coherent t	for attaining the course learning out	cal thinking. Show limited comes. Lack of analytical		
	Lecture wi	abilities and lack of critical problems.	to solve problems. ommand of knowledge and skills required al thinking, logical thinking and coherent t	for attaining the course learning out	cal thinking. Show limited comes. Lack of analytica apply knowledge to solve		
Course Teaching		abilities and lack of critical problems.	to solve problems. ommand of knowledge and skills required al thinking, logical thinking and coherent t ent course	for attaining the course learning out	cal thinking. Show limited comes. Lack of analytica		
Course Teaching	Activities Lectures Laborator	abilities and lack of critical problems. ith laboratory compones	e to solve problems. ommand of knowledge and skills required all thinking, logical thinking and coherent the course Details e-lectures (video recordings) specimen-based labs	for attaining the course learning out	cal thinking. Show limited comes. Lack of analytica apply knowledge to solve No. of Hours 24 24		
Course Teaching	Activities Lectures	abilities and lack of critical problems. ith laboratory compones	e to solve problems. ommand of knowledge and skills required all thinking, logical thinking and coherent the course Details e-lectures (video recordings) specimen-based labs group discussions	for attaining the course learning out thinking. Show little or no ability to a	cal thinking. Show limited comes. Lack of analytica apply knowledge to solve No. of Hours 24		
Course Teaching	Activities Lectures Laborator Tutorials	abilities and lack of critical problems. ith laboratory compones	e to solve problems. ommand of knowledge and skills required all thinking, logical thinking and coherent the course Details e-lectures (video recordings) specimen-based labs group discussions course textbook, topical scier	for attaining the course learning out thinking. Show little or no ability to a	cal thinking. Show limited comes. Lack of analytica apply knowledge to solve No. of Hours 24 24		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborator Tutorials	abilities and lack of critics problems. ith laboratory compones. ry / Self study	e to solve problems. ommand of knowledge and skills required all thinking, logical thinking and coherent the course Details e-lectures (video recordings) specimen-based labs group discussions	for attaining the course learning out thinking. Show little or no ability to a	cal thinking. Show limited comes. Lack of analytical apply knowledge to solve No. of Hours 24 24 12		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborator Tutorials Reading	abilities and lack of critics problems. ith laboratory compones. ry / Self study	e to solve problems. ommand of knowledge and skills required all thinking, logical thinking and coherent the course Details e-lectures (video recordings) specimen-based labs group discussions course textbook, topical scier study	for attaining the course learning out thinking. Show little or no ability to a	cal thinking. Show limited comes. Lack of analytical apply knowledge to solve No. of Hours 24 24 12 90 Assessment Methods		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborator Tutorials Reading /	abilities and lack of critical problems. ith laboratory compones ry / Self study	e to solve problems. ommand of knowledge and skills required all thinking, logical thinking and coherent the course Details e-lectures (video recordings) specimen-based labs group discussions course textbook, topical scient study Details	for attaining the course learning out thinking. Show little or no ability to a notific papers and other self Weighting in final course grade (%)	No. of Hours 24 24 12 90 Assessment Methods to CLO Mapping		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborator Tutorials Reading / Methods Assignment	abilities and lack of critical problems. ith laboratory compones Ty / Self study	e to solve problems. ommand of knowledge and skills required all thinking, logical thinking and coherent the course Details e-lectures (video recordings) specimen-based labs group discussions course textbook, topical scient study Details lab reports	for attaining the course learning out thinking. Show little or no ability to a short thinking before the course and other self Weighting in final course grade (%) 60	No. of Hours 24 24 12 90 Assessment Methods to CLO Mapping CLO 1,2,3,4		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborator Tutorials Reading / Methods Assignme Examinat	abilities and lack of critical problems. ith laboratory compones Ty / Self study	e to solve problems. command of knowledge and skills required all thinking, logical thinking and coherent the course Details e-lectures (video recordings)	for attaining the course learning out thinking. Show little or no ability to a course papers and other self Weighting in final course grade (%) 60 30	No. of Hours 24 24 12 90 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4		
Course Teaching & Learning Activities Assessment Methods and Weighting	Activities Lectures Laborator Tutorials Reading / Methods Assignme Examinat Test	abilities and lack of critical problems. ith laboratory compones Ty / Self study ents ion	e to solve problems. command of knowledge and skills required all thinking, logical thinking and coherent the course Details e-lectures (video recordings)	for attaining the course learning out thinking. Show little or no ability to a short thinking before the course and other self Weighting in final course grade (%) 60	No. of Hours 24 24 12 90 Assessment Methods to CLO Mapping CLO 1,2,3,4		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activities Lectures Laborator Tutorials Reading / Methods Assignme Examinat Test Recomme	abilities and lack of critica problems. ith laboratory componeds ry / Self study ents cion ended textbooks from laboratory componeds	e to solve problems. command of knowledge and skills required all thinking, logical thinking and coherent the course Details e-lectures (video recordings) specimen-based labs group discussions course textbook, topical scient study Details lab reports 2-hour examination online quizzes HKU main library:	for attaining the course learning out thinking. Show little or no ability to a notific papers and other self Weighting in final course grade (%) 60 30 10	No. of Hours 24 24 12 90 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activities Lectures Laborator Tutorials Reading / Methods Assignme Examinat Test Recomme	abilities and lack of critica problems. ith laboratory componeds ry / Self study ents cion ended textbooks from laboratory componeds	e to solve problems. command of knowledge and skills required all thinking, logical thinking and coherent the course Details e-lectures (video recordings)	for attaining the course learning out thinking. Show little or no ability to a notific papers and other self Weighting in final course grade (%) 60 30 10	No. of Hours 24 24 12 90 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activities Lectures Laborator Tutorials Reading / Methods Assignme Examinat Test Recomme S.L. Brusa	abilities and lack of critica problems. iith laboratory compone is ry / Self study ents cion ended textbooks from latte. 2012. Dinosaur paratte.	e to solve problems. command of knowledge and skills required all thinking, logical thinking and coherent the course Details e-lectures (video recordings) specimen-based labs group discussions course textbook, topical scient study Details lab reports 2-hour examination online quizzes HKU main library: aleobiology. Wiley: New York. 322	for attaining the course learning out thinking. Show little or no ability to a show little or	cal thinking. Show limited comes. Lack of analytical apply knowledge to solve to sol		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activities Lectures Laborator Tutorials Reading / Methods Assignme Examinat Test Recomme S.L. Brusa M.K. Brett	abilities and lack of critical problems. iith laboratory componeds. Ty / Self study ents cion ended textbooks from latte. 2012. Dinosaur patts.	e to solve problems. command of knowledge and skills required all thinking, logical thinking and coherent the course Details e-lectures (video recordings) specimen-based labs group discussions course textbook, topical scient study Details lab reports 2-hour examination online quizzes HKU main library:	for attaining the course learning out thinking. Show little or no ability to a show little or	cal thinking. Show limited comes. Lack of analytical apply knowledge to solve to sol		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activities Lectures Laborator Tutorials Reading / Methods Assignme Examinat Test Recomme S.L. Brusa M.K. Brett University	abilities and lack of critica problems. iith laboratory compones. iith laboratory compones. Ty / Self study ents cion ended textbooks from It atte. 2012. Dinosaur patt-Surman, T.R. Holtz, Press: Bloomington.	e to solve problems. command of knowledge and skills required all thinking, logical thinking and coherent to ent course Details	for attaining the course learning out thinking. Show little or no ability to a course papers and other self Weighting in final course grade (%) 60 30 10 Ppp. [available as e-book] The complete dinosaur. Second	cal thinking. Show limited comes. Lack of analytical apply knowledge to solve to sol		
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Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Activities Lectures Laborator Tutorials Reading / Methods Assignme Examinat Test Recomme S.L. Brusa M.K. Brett University D.E. Fasto	abilities and lack of critica problems. ith laboratory componed ith laboratory componed ith laboratory componed ith laboratory componed ith laboratory componed ith laboratory componed ith laboratory constant ith laboratory constant ith laboratory constant laboratory constant laboratory constant laboratory constant laboratory constant laboratory constant laboratory constant laboratory constant laboratory constant laboratory constant laboratory constant laboratory constant laboratory constant laboratory constant laboratory componed it laboratory c	e to solve problems. command of knowledge and skills required all thinking, logical thinking and coherent to ent course Details	for attaining the course learning out thinking. Show little or no ability to a control of the course grade (%) Weighting in final course grade (%) 60 30 10 2pp. [available as e-book] The complete dinosaur. Second concise natural history. Third	cal thinking. Show limited comes. Lack of analytical apply knowledge to solve to sol		
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EASC2401	Fluid/so	lid interactions in ea	arth processes (6 credits)	Academic Yea	r 2020			
Offering Department	Earth Scie	ences		Quota				
Course Co-ordinator	Dr K H Lei	mke, Earth Sciences (ko	ono @hku.hk)					
Teachers Involved	(Dr K H Le	emke,Earth Sciences)						
Course Objectives	This cours	This course provides an overview of the physical and chemical principles that govern Earth processes						
Course Contents	List topics	List topics with approximate number of weeks						
& Topics		the laboratory, scaling ti						
		,	and the concept of equilibrium (2)					
		, i	s - sublimation, condensation, crystalli	sation and melting (2)				
		solution interfaces (1)		" " (0)				
			onments: convection, conduction and r					
			pe fractionation on geological time sc	ales(1)				
		an mechanics and basic v and particle transport (` '					
		onal, geostrophic and ce						
Course Learning		, 0	course, students should be able to:					
Outcomes			es of equilibrium thermodynamics as a	nnlied to the Earth Scien	1000			
outcomes			plain processes of fluid/solid interacti					
		nd solids	chain processes or lidid/solid interacti	ons, in particular system	is containing mens			
			changed throughout the Earth System	1				
			nding of principles governing isotope e		ale nhase system			
		nd across fluid/solid and		Acriange reactions in sin	gic priase system.			
			s of motion and the basic forces affect	ting movement of gases	liquids and solid			
		n Earth		ang movement or guess	, ilquido aria cona			
Pre-requisites		ASC1401 or EASC1402						
and Co-requisites	1 433 111 27	10014010121001402						
and Impermissible								
combinations)								
Offer in 2020 - 2021	Y 2nd	I sem Offer in 2021 - 2	022 : Y	Examination	No Exam			
Grade Descriptors	Α	Demonstrate thorough mas	tery at an advanced level of extensive know	ledge and skills required for a	attaining all the course			
(A+ to F)		learning outcomes. Show st	trong analytical and critical abilities and logical	thinking, with evidence of orig	inal thought, and abilit			
•		presentational skills.	ide range of complex, familiar and unfamiliar	situations. Apply highly effect	tive organizational and			
	В		mmand of a broad range of knowledge and sl	kills required for attaining at le	east most of the course			
	-	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familia						
	С	and some unfamiliar situations. Apply effective organizational and presentational skills.						
	C	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to mos						
		familiar situations. Apply moderately effective organizational and presentational skills.						
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes.						
		Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack						
			pilities, logical and coherent thinking. Show		ly knowledge to solve			
` T	problems. Organization and presentational skills are minimally effective or ineffective. Lecture with laboratory component course							
Course Type Course Teaching	_	, ,		T T	Na af U			
Course Teaching Learning Activities	Activities	5	Details		No. of Hours			
x Learning Activities	Lectures		12 sessions x 2 hour		24			
	Laborator	,	paper exercises		24			
		Self study		M 1 1 4 1 2 2 2	100			
Assessment Methods	Methods		Details	Weighting in final	Assessment			
and Weighting				course grade (%)	Methods			
	Dealt	aut	2 municate	45	to CLO Mapping			
	Project report		3 projects	45	CLO 1,2,3,4,5			
	Test	'	Two in-class examination (one for	55	CLO 1,2,3,4,5			
	Test		15% and another one for 40%)		CLO 1,2,3,4,5			
Required/recommended	Test	Chemical Thermodynam	,		CLO 1,2,3,4,5			
Required/recommended	Test		15% and another one for 40%)		CLO 1,2			

EASC2402	Field and laboratory methods (6 credits)	Academic Year	2020		
Offering Department	Earth Sciences	Quota	40		
Course Co-ordinator	Dr J A King, Earth Sciences (jessking@hku.hk)				
Teachers Involved	(Dr J A King,Earth Sciences) (Dr M C Cheung,Earth Sciences)				
Course Objectives	This course is hands-on field and laboratory-based that introduces basic ge mapping techniques and the use of geological equipment and air photogratural environment of Hong Kong.				
Course Contents & Topics	- Maps and map reading, map reference system (lectures and class practice) - Interpretation of geological and topographic maps: topographic and geological cross sections, geological structures from outcrop patterns and structural contour lines (horizontal, inclined strata, folded, and faulted strata, unconformities (lectures and class practice) - Interpretation and use of air photographs (class practice) - Field observation and description of rocks, outcrops (with fieldtrips in Hong Kong) - Field observation and description of landscape units (with fieldtrips in Hong Kong) - Laboratory equipment and technicues (lectures and lab sessions)				
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 read geological maps and comprehend 3-D geological structures fro CLO 2 construct a geological cross section showing interpreted subsurfal landscape units CLO 3 demonstrate techniques for basic field observations, measurements	ace rocks and structu			

	CLO 4 create and interpret an internally consistent geological and landscape maps from a set of collected field observations and data					
	CLO 5 develop skills in integrating geological field data in determining a geological and landscape history and writing a structured field report					
	CLO 6 L	CLO 6 understand to the basics of a series of laboratory techniques for geological and environmental st				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	EASC1401 or EASC1402	, , , , , , , , , , , , , , , , , , ,	<u> </u>		
Offer in 2020 - 2021	Y 1s	t sem Offer in 2021 - 20	022 : Y	Examination	No Exam	
Grade Descriptors (A+ to F)	Α	record observations on ear strong independent analyti	complete grasp of the subject in order th processes in the field and to apply cal, critical and logical thinking. Sho and geological map with highly effective	knowledge to familiar and unfamilia w strong ability to synthesize all	ar situations. Evidence of observations made and	
	В	Demonstrate substantial gr observations on earth proc independent analytical, criti	asp of the subject required for most of esses in the field and to apply knowle cal and logical thinking. Shows ability with effective organizational and present	of the learning outcome. Shows evidedge to familiar and some unfamiliat to synthesize all observations made	dence of ability to record or situations. Evidence of	
	Demonstrate general but incomplete grasp of the subject required for most of the learning outcome. Evidence of some ability to record observations on earth processes in the field and apply knowledge to most familiar situations. Evidence of some independent analytical, critical and logical thinking. Show ability to synthesize most observations made and knowledge in a field report and geological map with moderately effective organizational and presentational skills.					
	D Demonstrate partial but limited grasp of the subject required for most of the learning outcome. Evidence of limited ability to record observations on earth processes in the field and limited application of knowledge to solve problems. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to synthesize some observations made and knowledge in a field report and geological map with barely effective organizational and presentational skills.					
	Fail	Demonstrate little or no gra observations on earth proce little or lack of analytical	sp of the subject required for most of tesses in the field and show very little or and critical abilities, coherent and logowledge in a field report and geological	he learning outcome. Little or no evi no ability to apply knowledge to sol gical thinking. Shows very little or	idence of ability to record ve problems. Evidence of no ability to synthesize	
Course Type	Field car	nps				
Course Teaching	Activitie	es	Details		No. of Hours	
Learning Activities	Lectures	3	12 sessions x 1 hour	12		
	Field wo	rk	5-day field camp & 2 day trips		56	
	Laborate	ory work	12 hours paper exercises		12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignm	nents	Lab Assignments	10	CLO 1,2	
	Report		Field Work Assessment	70	CLO 2,3,4,5	
	Test			20	CLO 1,2	
Required/recommended reading and online materials		Comprehensive Course Notes provided. John Barnes: Basic Geological Mapping (Wiley, 1995, 3rd edition)				

EASC2404	Introduc	tion to atmosphere and hydrosphere (6 credits)	Academic Year	2020			
Offering Department	Earth Scie	nces	Quota	50			
Course Co-ordinator	Dr J R Ali,	Earth Sciences (jrali@hku.hk)					
Teachers Involved	\ \	ng,Earth Sciences) ,Earth Sciences)					
Course Objectives	This cours with one a	e introduces the atmosphere and hydrosphere systems, and ϵ nother.	explains at a basic level	how they interact			
Course Contents & Topics	forces sh Composition Moisture at Pressure at Coasts; Co	Introduction and course plan, Earth within a broader context (Solar System and other key features); Geological forces shaping the floor of the Oceans and Seas; Water Structure, Ocean Structure and Seawater Composition/Chemistry; Introduction to the Atmosphere; Heating Earth's surface and Atmosphere; Temperature; Moisture and Atmospheric Stability; Forms of condensation and precipitation; Hydrological Cycle - an overview; Air Pressure and Winds; Intro to Atmospheric Circulation and Weather Systems; Ocean Circulation; Waves; Tides; Coasts; Groundwater basics; Groundwater usage, contamination, caves and karst; Glaciers and glacial landscapes; Climate system, proxy data, causes of climate change; Effects of climate change.					
Course Learning		sful completion of this course, students should be able to:	<u> </u>				
Outcomes	CLO 2 apploce CLO 3 un Hy CLO 4 un the	derstand the important features which distinguish Earth from the rticularly with regards to its outer fluid envelopes preciate that on a geological timescale, the ocean basins and action and morphology, and why this is the case derstand the key features of water, and the critical role the drosphere system derstand the basic physical phenomena associated with the pir important lower-order elements awareness of the scientifically "hot" Atmosphere and Hydrogeness of the scientifically "hot" Atmosphere an	If the seas are continual ne compound plays in Atmosphere and the O	ly changing their			
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in EASC1401 or EASC1402					
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2022 : Y	Examination	Dec			
Grade Descriptors (A+ to F)	A	Thorough grasp of the subject; evidence of strong critical abilities and lopresentational skills; insightful use and critical analysis / evaluation of information quote/reference aptly; integration of the full range of appropriate theori. Substantial grasp of the subject; evidence of critical abilities and logical the	ation drawn from a full range o es, principles, evidence and te	f high quality sources chniques.			
	В	skills; critical use of relevant information from sources, showing ability to secondary interpretations and to quote/reference aptly; general integration of	make meaningful comparison theories, principles, evidence	ns between different and techniques.			
	С	General but incomplete grasp of the subject; evidence of some critical a organizational and presentational skills; use of relevant information from soul different interpretations and to quote/reference aptly; some partial integration	rces, showing ability to make o	comparisons between			

	D Limited grasp of the subject, retention of some relevant information of the subject; evidence of limited critical abi barely effective organizational and presentational skills; use and reference of several sources, but mainly through the rather than analysis and comparison; limited integration of theories, principles, evidence and techniques. Fail Little or no grasp of the knowledge and understanding of the subject; little or no evidence of critical abilities and log thinking; incoherent organization and poor presentational skills; limited use of secondary sources and no critical						
		integration of theories, principles, e		no critical companson of			
Course Type	Lecture with laboratory compor	nent course					
Course Teaching & Learning Activities	Activities	Details		No. of Hours			
	Lectures			24			
	Laboratory	including tutorials & disc	ussion	24			
	Project work						
	Reading / Self study			90			
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments		20	CLO 4,5			
	Essay		25	CLO 1,2,3,4,5			
	Examination		50	CLO 1,2,3,4,5			
	Presentation		5	CLO 1,2,3,4,5			
Required/recommended reading and online materials		Fom S. Garrison: Oceanography: An Invitation to Marine Science Frederick K. Lutgens and Edward J. Tarbuck: The Atmosphere: An Introduction to Meteorology					
Additional Course Information	(November) due to the University	by any chance it is not possible for the group presentations to carried out, as was the case in Semester 1 2019 ovember) due to the University campus activities being suspended, the associated individual essay mark will be creased from 25 to 30 and the group presentation score will be dropped.					

EASC2406	Geoch	emistry (6 credits)		Academic Yea	r 2020				
Offering Department	Earth So	ciences		Quota					
Course Co-ordinator	Dr S H L	i, Earth Sciences (shl	i@hku.hk)						
Teachers Involved	(Dr S H	Li,Earth Sciences)							
Course Objectives		This course provides an understanding of the fundamentals and approaches for geochemical analysis. It introduces students to the basic chemical principles, modern techniques and quantitative analysis for studying the earth.							
Course Contents & Topics	- Differer - Aqueor - Trace e - Chemis - Chemic - Radioa - Stable - Oxidati	- Physical and chemical state of the earth, - Differentiation of and cosmic abundance of elements, - Aqueous solutions and chemistry of natural water, - Trace element, - Chemistry of igneous rocks, - Chemical controls on soil formation, - Radioactive isotope geochemistry, - Stable isotope geochemistry, - Oxidation and reduction, - Chemical weathering							
Course Learning	On succ	successful completion of this course, students should be able to:							
Outcomes	CLO 1 CLO 2 CLO 3	CLO 1 demonstrate an understanding of basic principles of geochemistry and their applications to geological studies CLO 2 describe element distribution in major rocks CLO 3 apply the principles of isotopes to dating and studies of petrogenesis and climate changes CLO 4 demonstrate knowledge of the chemical weathering processes							
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in EASC1402							
Offer in 2020 - 2021	Y 19	st sem Offer in 2021	- 2022 : Y	Examination	Dec				
Grade Descriptors (A+ to F)	A Demonstrate extensive knowledge and skills at an advanced level required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, and ability to apply highly effective lab skills and techniques to solve problems. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.								
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply effective lab skills and techniques to solve problems. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.								
	С	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply moderately effective lab skills and techniques to solve problems. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.							
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities, and limited ability to apply partially effective lab skills and techniques to solve problems. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.								
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking, and ability to apply minimally effective or ineffective lab skills and techniques to solve problems. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.								
Course Type	Lecture	with laboratory compo	nent course						
Course Teaching	Activiti	es	Details		No. of Hours				
Learning Activities	Lecture	S	12 sessions x 2 hours		24				
	Laborat	ory	paper exercises		24				
	Tutorials				6				
	Reading	g / Self study			100				
Assessment Methods	Method	ls	Details	Weighting in final	Assessment				
and Weighting				course grade (%)	Methods to CLO Mappin				

	Examination		60	CLO 1,2,3,4
reading and	Fure G.: Principle and applications Krauskopf K.B. and Bird D.K. Introd Walther J.V.: Essentials of Geoche	luction to Geochemistry (McGraw-l	Hill, Inc. 1995, 3rd ed.)	

EASC2407	Mineral	ogy (6 credits)		Academic Ye	ar 2020		
Offering Department	Earth Scie	ences		Quota	30		
Course Co-ordinator	Prof M Su	ın, Earth Sciences (mins	sun @hku.hk)				
eachers Involved	(Prof M F	Zhou,Earth Sciences)	<u> </u>				
	(Prof M S	un,Earth Sciences)					
Course Objectives	To provid	e essential knowledge	of mineralogy, to familiarize	students with common mineral	s that are basis fo		
-	study of p	etrography of igneous, s	sedimentary and metamorphic	rocks.			
Course Contents		crystallization, mineral cl					
& Topics	- Mineral	symmetry, Miller indices	•				
•	- Physical	properties of minerals					
	- Mineral	composition, structure ar	nd classification				
	- Identifica	ation of rock forming min	erals-hand specimens				
		etrographic microscope					
		properties under plane po	· ·				
		properties under orthoso	•				
		properties under conosco	•				
		ation of rock forming min	erals in thin sections				
		al variations of minerals					
Course Learning			course, students should be ab				
Outcomes	CLO 1		nd systems used in classificat				
	CLO 2		erties to identify rock-forming	minerals			
	CLO 3	describe the principle of					
	CLO 4 identify the common rock-forming minerals in hand specimens and thin sections						
Pre-requisites	Pass in E.	Pass in EASC1402					
and Co-requisites							
and Impermissible							
combinations)							
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20		Examination	Dec		
Grade Descriptors (A+ to F)	Demonstrate extensive knowledge and skills at an advanced level required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, and ability to apply highly effective lab skills and techniques to solve problems. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.						
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply effective lab skills and techniques to solve problems. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply moderately effective					
		lab skills and techniques to solve problems. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills					
	D	conclusions. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes.					
		Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities, and limited ability to apply partially effective lab skills and techniques to solve problems. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lac of analytical and critical abilities, logical and coherent thinking, and ability to apply minimally effective or ineffective lab skills an techniques to solve problems. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture w	ith laboratory componen					
Course Teaching	Activities	•	Details		No. of Hours		
Learning Activities	Lectures	•	12 sessions x 2 hours		24		
Learning Activities					24		
	Laboratory Reading / Self study		12 sessions x 2 hours				
\aaaaamant Matha -!-			B. (. 1)	M	100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents		40	CLO 1,2,3,4		
	Examinat			60	CLO 1,2,3,4		
	C. Klein a	nd C.S. Hurlbat: Manual	of Mineralogy (Wiley, 1999, 1	st ed.)	,-,-,-		
reading and	W.D. Nes	se: introduction to Optica	al Mineralogy (Oxford Univers	ity Press, 1998, 2nd ed).			

EASC2408	Planetary geology (6 credits)	cademic Year	2020		
Offering Department	Earth Sciences Q	uota			
Course Co-ordinator	Dr M H Lee, Earth Sciences (mhlee @hku.hk)				
Teachers Involved	(Dr J Michalski,Earth Sciences) (Dr M H Lee,Earth Sciences)				
Course Objectives	This course provides students with an introduction to the origin, evolution, structure matter in the Solar System condensed in the form of planets, satellites, comets, as emphasis on surface features, internal structures and histories from a geologi incorporates the findings from recent space investigations, planetary imagery, remote to extraterrestrial features into a fascinating portrayal of the geological activities and	steroids and ring ical point of vi ote sensing and	gs, with particula ew. The course Earth analogue		
Course Contents & Topics	Formation, evolution, internal structure and surface processes of planetary bodies; the terrestrial planets Mercury, Venus, the Earth-Moon system, and Mars; the giant planets Jupiter, Saturn, Uranus, and Neptune and their moons; Pluto, Charon and the Kuiper Belt; asteroids, meteorites, comets and the Oort cloud; Origin of our Solar System.				
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 describe the basic features of our Solar System and its constituents	-			

Required/recommended reading and online materials	N. McBri	Test 15 CLO 1,2,3,4 I. McBride and I. Gilmour: An Introduction to the Solar System (Cambridge University Press, 2004)				
	Test			15	CLO 1,2,3,4	
	Presenta	ation		15	CLO 1,2,3,4	
	Examina	ation		50	CLO 1,2,3,4	
	Assignm	nents		20	CLO 1,2,3,4	
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Reading	/ Self study			100	
	Laborato	,	12 sessions x 2 hours	12 sessions x 2 hours		
& Learning Activities	Lectures	-	12 sessions x 2 hours	1		
Course Teaching	Activitie		Details			
Course Type		with laboratory comp			No. of Hours	
	Fail	knowledge to solve p Demonstrate little or of analytical and cri problems. Organizati	roblems. Apply limited or barely effec no evidence of command of knowled tical abilities, logical and coherent on and presentational skills are minim	tive organizational and presentational skills. Ige and skills required for attaining the course thinking. Show very little or no ability to ap	learning outcomes. Lack	
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	В	learning outcomes. S and some unfamiliar	show evidence of analytical and critical situations. Apply effective organizatio		pply knowledge to familiar	
Grade Descriptors (A+ to F)	A	strong analytical and wide range of comple	critical abilities and logical thinking, ex, familiar and unfamiliar situations. A	nd skills required for attaining all the course I with evidence of original thought, and ability Apply highly effective organizational and prese	to apply knowledge to a entational skills.	
Offer in 2020 - 2021	Y 2n		21 - 2022 : Y	Examination	May	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in EASC1401 or EASC1402 or PHYS1650					
	CLO 4 compare and contrast our own planet Earth with other planetary bodies					
		CLO 3 demonstrate knowledge and understanding of the key geological, physical and chemical proces governing the structure, formation and evolution of planetary bodies				
		2 explain how this knowledge is acquired through observations and experiments				

EASC2409	Regiona	I field studies (6 credits)		Academic Year	2020
Offering Department	Earth Sci	ences		Quota	10
Course Co-ordinator	Dr J R Ali	Earth Sciences (jrali@hku.hk)			
Teachers Involved	(Dr J R Al (Dr MC C	Webb (Japan Field Trip),Earth Sciences) i (Taiwan Field Trip),Earth Sciences) neung (Taiwan & Japan Field Trip),Earth h Sciences)	Sciences)		
Course Objectives	Kong thro	se is field-based and introduces geology ugh hands on studies and field excursions e is compulsory for students doing the Ge		d/or regions in the	e vicinity of Hong
Course Contents & Topics Course Learning Outcomes	Geologica - Geologica - Recogni - Field rec - Stratigra - Field ge - Enginee - Manage - Basic ge On succe	e will introduce the following topics: Il studies in Southern China, Japan, and/ocal history of S. China, Japan, and/or Taiwation of rock units and minerals in the field ognition and description of geological struphic measurements ology of active and passive margins, volcaring geology ment of geological hazards ological mapping techniques asful completion of this course, students save acquired a broad understanding of the state o	an ctures nic systems nould be able to:	particular, Taiwa	n, Japan and/or
	CLO 3 ha	outh China e able to undertake basic field observation inerals ave acquired at least 3 days of experience evelop skills in integrating geological field eld report	s, stratigraphic measuremer in independent stratigraphic	its and identificati	ons of rocks and
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in EASC1401 or EASC1402; and consent of course coordinator				
Offer in 2020 - 2021	Y Ye	ar long Offer in 2021 - 2022 : Y		Examination	No Exam
Grade Descriptors (A+ to F)	A	Demonstrate an advanced level of understanding eological history of the study region, as we measurements.	as strong ability to produce go	ood-quality reports o	n independent field
	В	Demonstrate a satisfactory understanding of the history of the study region and acceptable level of Could only demonstrate an incomplete unders	competence in field measurement to	echniques.	
	С	observations and a basic knowledge on field mea	urement techniques.		
	D	Demonstrate limited understanding of the geology			
	Fail	Show no or little knowledge of the geology of the measurement techniques.	sludy sites and lack of ability in m	aking tield observatio	ris and applying field

Course Type	Field camps			
Course Teaching	Activities	Details		No. of Hours
& Learning Activities	Field work	14 days		100
	Reading / Self study			20
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Report		100	CLO 1,2,3,4
Required/recommended reading and online materials	Comprehensive course notes pr	rovided		
online materials Additional Course Information Priority for being able to take this course is give participated in the linked field trip in the preceding and those doing the Geology/Geology Intensive materials. The Taiwan trip will be in early January of each y light of the current COVID-19 outbreak situation, 2021 have yet to be confirmed. The Jan 2020 fieldtrip to Taiwan (part of EASC development makes it not viable to go to Taiwan day session for local field exposures will be an January but possibly in late May/early June) A virtual version of Kyushu field trip (or someworth)			emic year and completed the associ Kyushu trip will start in March of eac act arrangement of Taiwan trip and h will be led by Dr Jason Ali. If the C he Taiwan field trip will be postponed ive of the Taiwan field trip (to run if	ated assignment(s), th year. However, in Kyushu trip for 2020- COVID-19 pandemic to May 2020 or a 6- t preferably in early the second part of

EASC2410	Data ana	llysis and modelin	ng in earth sciences (6 credits)	Academic Yea	r 2020		
Offering Department	Earth Scie	nces			Quota			
Course Co-ordinator	Dr B Zhan	r B Zhang, Earth Sciences <i>(binzh</i> @ <i>hku.hk)</i>						
Teachers Involved	(Dr B Zhar	ng,Earth Sciences)						
Course Objectives			approach to introduce the basic pg Python through practical examples.		f data analysis	and mathematica		
Course Contents & Topics	data analy	rthon programming basics; NumPy and Matplotlib; Data wrangling with Pandas; Visualisation, Maps; Statistica ta analysis including distributions, hypothesis testing, regression; Time series analysis including spectrum and ecomposition; Introduction to geospatial data analysis; numerical solutions to mathematical equations.						
Course Learning	On succes	sful completion of this	course, students should be able to:					
Outcomes	CLO 1 Ex	plain basic statistical	concepts and their applications to ea	rth science	data processing	and modeling		
	CLO 2 De	monstrate knowledge	in basic numerical methods, their ap	plications i	n earth sciences	, and limitations		
		ply appropriate metho ftware	ods to analyze, process and visualize	e earth scie	nce data, with th	e help of computer		
Pre-requisites	Pass in EA	ASC1401						
(and Co-requisites and Impermissible								
combinations) Offer in 2020 - 2021	Y 2nd sem Offer in 2021 - 2022 : Y Examination					No Exam		
Grade Descriptors	A 2110			ired for attain				
(A+ to F)	A Demonstrate thorough mastery of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.							
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.							
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	D							
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lac of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.							
Course Type	Lecture wi	th laboratory compone	ent course					
Course Teaching	Activities	i	Details			No. of Hours		
& Learning Activities	Lectures					24		
	Laborator	у				24		
	Reading /	Self study				100		
Assessment Methods and Weighting	Methods		Details		ting in final grade (%)	Assessment Methods to CLO Mapping		
	Assignme	nts	Assignments (55%) and inclass quiz (5%)		60	CLO 1,2,3		
	Test		Two in-class examinations (20% each)		40	CLO 1,2,3		
Required/recommended reading and online materials	Python for	beginners: https://ww	w.python.org/about/gettingstarted/					

EASC3020	Global change: anthropogenic impacts (6 credits)	Academic Year	2020
Offering Department	Earth Sciences	Quota	
Course Co-ordinator	Dr Z H Liu, Earth Sciences (zhliu@hku.hk)		
Teachers Involved	(Dr Z H Liu, Earth Sciences)		
reactions involved	(B) 2 11 Ela, Editi Odioloco)		

Course Objectives			le of humans in global change and the change will be discussed.	e environmental respons	es to such changes.	
Course Contents & Topics	Global warming, greenhouse gas emission, past climates, climatic and environmental changes vs. culture evolution, natural vs. anthropogenic climate change, model projections of future climate change, scientific uncertainty, impacts of climate change, including sea level, fresh water, food, ecosystems and human health					
Course Learning	On succe	essful completion of th	is course, students should be able to:			
Outcomes	CLO 1 recognise the complexity of global climate systems					
	CLO 2	CLO 2 recognise the controversy of anthropogenic global warming				
	CLO 3	didentify modern environmental issues				
	CLO 4	assess the credib	ility of various scientific arguments			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	EASC2404 or ENVS20	001			
Offer in 2020 - 2021	Y 1st	t sem Offer in 2021	- 2022 : N	Examination	Dec	
Grade Descriptors (A+ to F)	A	learning outcomes. Sho to apply knowledge to a draw appropriate and in:	mastery at an advanced level of extensive know strong analytical and critical abilities and logic wide range of complex, familiar and unfamiliar sightful conclusions. Show insightful use and critures and to quote/reference aptly.	cal thinking, with evidence of or situations. Demonstrate critical	iginal thought, and ability use of data and results to	
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate correct use of data and results to draw appropriate conclusions. Show critical use of relevant information from sources and ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Demonstrate mostly correct but some erroneous use of data and results to draw appropriate conclusions. Show use of relevant information from sources and ability to make comparisons between different interpretations and to quotel/reference aptly.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Demonstrate limited ability to use data and results to draw appropriate conclusions. Show use and reference of several sources, but mainly through summary rather than analysis and comparison.				
	Fail	Demonstrate little or no of analytical and critica problems. Demonstrate	evidence of command of knowledge and skills r al abilities, logical and coherent thinking. Show misuse of data and results and/or unable to no critical comparison of them.	equired for attaining the course v very little or no ability to ap	oply knowledge to solve	
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	vities Details		No. of Hours		
& Learning Activities	Lectures				36	
	Project work			30		
	Tutorials				12	
	Discussi	on			24	
	Reading / Self study				48	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods	
					to CLO Mapping	
	Essay		Coursework Assessment	25		
	Essay Examina	tion	Coursework Assessment One 2-hour written examination	25 50	to CLO Mapping	

EASC3402	Petrology (6 credits)	Academic Year	2020
Offering Department	Earth Sciences	Quota	
Course Co-ordinator	Prof G Zhao, Earth Sciences (gzhao@hku.hk)		
Teachers Involved	(Dr M Pittman,Earth Sciences) (Prof G Zhao,Earth Sciences) (Prof M Sun,Earth Sciences)		
Course Objectives	To give students an understanding of the features in sedimer ability to identify major rock types and their textures and struc		
Course Contents & Topics	Magma and magmatism; textures and structures of igner volcanism and plutonism Basic igneous rocks Intermediate igneous rocks Acid igneous rocks Sedimentary diagenesis, classification of sedimentary rocks; Clastic sedimentary rocks: conglomerate and sandstone, silt Biochemical sedimentary rocks: limestone and dolostone Metamorphism; controlling factors of metamorphism; texture of metamorphic rocks Meta-pelitic rocks Meta-basic rocks Meta-carbonate rocks and meta-felsic rocks	; textures and structures of sediment tstone and mudstone	ary rocks.
Course Learning Outcomes	On successful completion of this course, students should be a CLO 1 identify major igneous rocks and their textures armicroscope CLO 2 identify major sedimentary rocks and their textures microscope CLO 3 identify major metamorphic rocks and their textures microscope CLO 4 make full description and write report on the above ro	and structures in both hand specing and sp	mens and under
Pre-requisites (and Co-requisites and Impermissible	Pass in EASC2407	on 1,400	

combinations)				I=	
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2		Examination	May
Grade Descriptors (A+ to F)	Α	learning outcomes. Show st		xtensive knowledge and skills required for ies and logical thinking, with evidence of ori unfamiliar situations.	
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations.			
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations.			
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems.			
	Fail			e and skills required for attaining the course g. Show very little or no ability to apply know	
Course Type	Lecture wit	h laboratory componen	t course		
Course Teaching	Activities	s Details			
& Learning Activities	Lectures		12 sessions x 2 hours		24
	Laboratory		specimen descriptions & thin-section observations under microscope		24
	Reading /	Self study	·		100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignmen	nts		30	CLO 1,2,3,4
	Examination			60	CLO 1,2,3,4
	Test			10	CLO 1,2,3,4
Required/recommended reading and online materials	Harvey Bla	itt and Robert J. Tracy,	Petrology (Second Edition	n; W.H. Freman and Company, New	/ York)

EASC3403	Seaimei	ntary environme	nts (6 creaits)	Academic Ye	ai 2020	
Offering Department	Earth Scie	ences		Quota		
Course Co-ordinator	Dr J King,	Earth Sciences (jes	ssking@hku.hk)			
Teachers Involved	١	,Earth Sciences) heung,Earth Scienc	ces)			
Course Objectives			origin, diagenesis, classification and nd processes of sedimentary geology			
Course Contents & Topics	PhysicsSedimerDepositiDepositiSequenoBasin anSedimer	ntary structures conal environments (i conal environments (i ce stratigraphy	tation and sedimentation non-marine) marine) round Hong Kong			
Course Learning	On succes	ssful completion of t	his course, students should be able to	0:		
Outcomes	CLO 1	describe the nature	e and significance of sedimentary feat	tures and structures		
	CLO 2		and siliciclastic rocks in hand sample			
	CLO 3	describe the facies	in a depositional environment			
	CLO 4					
	CLO 5	7 0 1				
Pre-requisites						
and Impermissible combinations)						
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	Y 2nd	I sem Offer in 202		Examination	May	
and Impermissible combinations)	Α	Demonstrate thorough Apply highly effective is	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly	bilities and logical thinking, with evic y effective organizational and preser	lence of original though	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A B	Demonstrate thorough Apply highly effective land Demonstrate substantia skills and techniques.	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytic Apply highly effective organizational and prese	bilities and logical thinking, with evic y effective organizational and preser al abilities and logical thinking. App entational skills.	lence of original though ntational skills. ly effective lab/fieldwor	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Α	Demonstrate thorough Apply highly effective land Demonstrate substanti skills and techniques. A Demonstrate general b	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytica	bilities and logical thinking, with evic y effective organizational and preser al abilities and logical thinking. App intational skills. ne analytical abilities and logical thi	lence of original though ntational skills. ly effective lab/fieldwor nking. Apply moderatel	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A B C D	Demonstrate thorough Apply highly effective Is Demonstrate substanti skills and techniques. A Demonstrate general te effective lab/fieldwork s Demonstrate partial bu lab/fieldwork skills and	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytic Apply highly effective organizational and prese but incomplete grasp of the subject. Show sor skills and techniques. Apply moderately effective to limited grasp of the subject. Show some an- techniques. Apply limited or barely effective or	bilities and logical thinking, with evicy effective organizational and preser al abilities and logical thinking. Appintational skills. The analytical abilities and logical thive organizational and presentational alytical abilities and logical thinking rganizational and presentational skills.	lence of original though ntational skills. ly effective lab/fieldwor nking. Apply moderatel skills. Apply partially effectiv ls.	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	A B C D Fail	Demonstrate thorough Apply highly effective is Demonstrate substanti skills and techniques. A Demonstrate general be effective lab/fieldwork s Demonstrate partial bu lab/fieldwork skills and Demonstrate little or n effective lab/fieldwork s	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytic Apply highly effective organizational and prese but incomplete grasp of the subject. Show sor skills and techniques. Apply moderately effectivat it limited grasp of the subject. Show some an- techniques. Apply limited or barely effective or orgasp of the subject. Evidence of little or lack skills and techniques. Organization and presen	bilities and logical thinking, with evicy effective organizational and preser al abilities and logical thinking. Appintational skills. me analytical abilities and logical thive organizational and presentationa alytical abilities and logical thinking rganizational and presentational skills of analytical abilities and logical to skills of analytical abilities and logical to skills of analytical abilities and logical to skills with the same series and logical to s	lence of original though ntational skills. ly effective lab/fieldwor nking. Apply moderatel skills. Apply partially effectiv ls.	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	A B C D Fail Lecture w	Demonstrate thorough Apply highly effective is Demonstrate substanti skills and techniques. J Demonstrate general is effective lab/fieldwork s Demonstrate partial but lab/fieldwork skills and Demonstrate little or n effective lab/fieldwork stith I laboratory compo	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytic Apply highly effective organizational and prese but incomplete grasp of the subject. Show sor skills and techniques. Apply moderately effectivat it limited grasp of the subject. Show some an techniques. Apply limited or barely effective or orgasp of the subject. Evidence of little or lac skills and techniques. Organization and presen prenent course	bilities and logical thinking, with evicy effective organizational and preser al abilities and logical thinking. Appintational skills. me analytical abilities and logical thive organizational and presentationa alytical abilities and logical thinking rganizational and presentational skills of analytical abilities and logical to skills of analytical abilities and logical to skills of analytical abilities and logical to skills with the same series and logical to s	lence of original though national skills. ly effective lab/fieldwor nking. Apply moderatel skills. Apply partially effectiv ls. hinking. Apply minimal	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	A B C D Fail Lecture w Activities	Demonstrate thorough Apply highly effective is Demonstrate substanti skills and techniques. J Demonstrate general is effective lab/fieldwork s Demonstrate partial but lab/fieldwork skills and Demonstrate little or n effective lab/fieldwork stith I laboratory compo	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly lial grasp of the subject. Show strong analytic Apply highly effective organizational and prese but incomplete grasp of the subject. Show sor skills and techniques. Apply moderately effective til timited grasp of the subject. Show some an techniques. Apply limited or barely effective or o grasp of the subject. Evidence of little or lack skills and techniques. Organization and present course Details	bilities and logical thinking, with evicy effective organizational and preser al abilities and logical thinking. Appintational skills. me analytical abilities and logical thive organizational and presentationa alytical abilities and logical thinking rganizational and presentational skills of analytical abilities and logical to skills of analytical abilities and logical to skills of analytical abilities and logical to skills with the same series and logical to s	lence of original though tational skills. ly effective lab/fieldwor nking. Apply moderate skills. Apply partially effectiv ls. hinking. Apply minimal	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	A B C D Fail Lecture w	Demonstrate thorough Apply highly effective is Demonstrate substanti skills and techniques. J Demonstrate general is effective lab/fieldwork s Demonstrate partial but lab/fieldwork skills and Demonstrate little or n effective lab/fieldwork stith I laboratory compo	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytica Apply highly effective organizational and prese but incomplete grasp of the subject. Show sor skills and techniques. Apply moderately effectivat limited grasp of the subject. Show some an techniques. Apply limited or barely effective or o grasp of the subject. Evidence of little or lac skills and techniques. Organization and present course Details	bilities and logical thinking, with evicy effective organizational and preser al abilities and logical thinking. Appintational skills. me analytical abilities and logical thive organizational and presentationa alytical abilities and logical thinking rganizational and presentational skills of analytical abilities and logical to skills of analytical abilities and logical to skills of analytical abilities and logical to skills with the same series and logical to s	lence of original though tational skills. ly effective lab/fieldwor nking. Apply moderate I skills. Apply partially effectiv is. hinking. Apply minimal	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	A B C D Fail Lecture w Activities Lectures Laborator	Demonstrate thorough Apply highly effective Is Demonstrate substanti skills and techniques. A Demonstrate general it effective lab/fieldwork s Demonstrate partial but lab/fieldwork skills and Demonstrate little or neffective lab/fieldwork skills ith laboratory compositions.	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytical Apply highly effective organizational and prese but incomplete grasp of the subject. Show sor skills and techniques. Apply moderately effectivat limited grasp of the subject. Show some an techniques. Apply limited or barely effective or ograsp of the subject. Evidence of little or lact skills and techniques. Organization and present course Details 12 sessions x 2 hours	bilities and logical thinking, with evicy effective organizational and preser al abilities and logical thinking. Appintational skills. me analytical abilities and logical thive organizational and presentationa alytical abilities and logical thinking rganizational and presentational skills of analytical abilities and logical to skills of analytical abilities and logical to skills of analytical abilities and logical to skills with the same series and logical to s	lence of original thoughtational skills. ly effective lab/fieldworkskills. Apply moderate skills. Apply partially effectivels. hinking. Apply minimal No. of Hours 24 12	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	A B C D Fail Lecture w Activities Lectures Laborator Field wor	Demonstrate thorough Apply highly effective Is Demonstrate substanti skills and techniques. Demonstrate general teffective lab/fieldwork of Demonstrate partial but lab/fieldwork skills and Demonstrate little or neffective lab/fieldwork skills and Demonstrate little or neffective lab/fieldwork skills and Demonstrate little or neffective little or	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytical Apply highly effective organizational and prese but incomplete grasp of the subject. Show sor skills and techniques. Apply moderately effective til limited grasp of the subject. Show some an techniques. Apply limited or barely effective or o grasp of the subject. Evidence of little or lac skills and techniques. Organization and presendent course Details 12 sessions x 2 hours 6 sessionsx 2 hours 1 day trip with field project	bilities and logical thinking, with evicy effective organizational and preser al abilities and logical thinking. Appintational skills. me analytical abilities and logical thinking appintational skills and logical thinking organizational and presentational alytical abilities and logical thinking rganizational and presentational skills of analytical abilities and logical thattional skills are ineffective.	lence of original thoughtational skills. ly effective lab/fieldwork iskills. Apply moderate skills. Apply partially effectivels. hinking. Apply minimal No. of Hours 24 12 8	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	A B C D Fail Lecture w Activities Lectures Laborator Field wor Project w	Demonstrate thorough Apply highly effective Is Demonstrate substanti skills and techniques. Demonstrate general effective lab/fieldwork sometime Demonstrate partial bulab/fieldwork skills and Demonstrate little or neffective lab/fieldwork skills and Demonstrate little or neffective little or neffective li	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytical Apply highly effective organizational and prese but incomplete grasp of the subject. Show sor skills and techniques. Apply moderately effectivat limited grasp of the subject. Show some an techniques. Apply limited or barely effective or ograsp of the subject. Evidence of little or lact skills and techniques. Organization and present course Details 12 sessions x 2 hours	bilities and logical thinking, with evicy effective organizational and preser al abilities and logical thinking. Appintational skills. me analytical abilities and logical thinking appintational skills and logical thinking organizational and presentational alytical abilities and logical thinking rganizational and presentational skills of analytical abilities and logical thattional skills are ineffective.	lence of original though tational skills. Ily effective lab/fieldwornking. Apply moderatel skills. Apply partially effectives. Apply partially effectives. Apply minimall No. of Hours 24 12 8 12	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching Learning Activities	A B C D Fail Lecture w Activities Lectures Laborator Field wor Project w	Demonstrate thorough Apply highly effective Is Demonstrate substanti skills and techniques. Demonstrate general teffective lab/fieldwork of Demonstrate partial but lab/fieldwork skills and Demonstrate little or neffective lab/fieldwork skills and Demonstrate little or neffective lab/fieldwork skills and Demonstrate little or neffective little or	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytical Apply highly effective organizational and prese but incomplete grasp of the subject. Show sor skills and techniques. Apply moderately effective til limited grasp of the subject. Show some an techniques. Apply limited or barely effective or o grasp of the subject. Evidence of little or lac skills and techniques. Organization and presendent course Details 12 sessions x 2 hours 6 sessionsx 2 hours 1 day trip with field project	bilities and logical thinking, with evicy effective organizational and preser al abilities and logical thinking. Appintational skills. me analytical abilities and logical thinking appintational skills and logical thinking organizational and presentational alytical abilities and logical thinking rganizational and presentational skills of analytical abilities and logical thattional skills are ineffective.	lence of original though tational skills. Iy effective lab/fieldwork skills. Apply moderate skills. Apply partially effectives. Apply partially effectives. Apply partially effectives. Apply minimal No. of Hours 24 12 8	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching & Learning Activities	A B C D Fail Lecture w Activities Lectures Laborator Field wor Project w	Demonstrate thorough Apply highly effective Is Demonstrate substanti skills and techniques. A Demonstrate general teffective lab/fieldwork sills and Demonstrate partial bulab/fieldwork skills and Demonstrate little or ne	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytical Apply highly effective organizational and prese but incomplete grasp of the subject. Show sor skills and techniques. Apply moderately effective til limited grasp of the subject. Show some an techniques. Apply limited or barely effective or o grasp of the subject. Evidence of little or lac skills and techniques. Organization and presendent course Details 12 sessions x 2 hours 6 sessionsx 2 hours 1 day trip with field project	bilities and logical thinking, with evicy effective organizational and preser al abilities and logical thinking. Appintational skills. me analytical abilities and logical thinking appintational skills and logical thinking organizational and presentational alytical abilities and logical thinking rganizational and presentational skills of analytical abilities and logical thattional skills are ineffective.	lence of original though tational skills. ly effective lab/fieldwor nking. Apply moderatel skills. Apply partially effectiv is. hinking. Apply minimal No. of Hours 24 12 8 12 90 Assessment Methods	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching & Learning Activities	A B C D Fail Lecture w Activities Lectures Laborator Field wor Project w Reading	Demonstrate thorough Apply highly effective Is Demonstrate substanti skills and techniques. A Demonstrate general be effective lab/fieldwork si Demonstrate partial but lab/fieldwork skills and Demonstrate little or ne effective lab/fieldwork si ith laboratory composite.	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytical Apply highly effective organizational and prese but incomplete grasp of the subject. Show sor skills and techniques. Apply moderately effective to the subject show some and techniques. Apply limited or barely effective or o grasp of the subject. Evidence of little or lac skills and techniques. Organization and presendent course Details 12 sessions x 2 hours 6 sessionsx 2 hours 1 day trip with field project Examples for sedimentary environment course 1 day trip with field project Examples for sedimentary environment course 1 day trip with field project Examples for sedimentary environmentary environme	bilities and logical thinking, with evicy effective organizational and preser al abilities and logical thinking. Appintational skills. me analytical abilities and logical thinking analytical abilities and logical thinking reganizational and presentational alytical abilities and logical thinking rganizational and presentational skills of analytical abilities and logical thatational skills are ineffective. Tonments Weighting in final	lence of original though tational skills. Ily effective lab/fieldwornking. Apply moderatel skills. Apply partially effectivis. Apply partially effectivis. No. of Hours 24 12 8 12 90 Assessment Methods	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching & Learning Activities	A B C D Fail Lecture w Activities Lectures Laborator Field wor Project w Reading Methods	Demonstrate thorough Apply highly effective Is Demonstrate substanti skills and techniques. A Demonstrate general befective lab/fieldwork shills and Demonstrate partial but lab/fieldwork skills and Demonstrate little or neffective lab/fieldwork skills and Demonstrate little or neffective lab/fieldwork skith laboratory composite lab/fieldwork skith laboratory composite little of the laboratory composite little laboratory composite la	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytical Apply highly effective organizational and prese but incomplete grasp of the subject. Show sor skills and techniques. Apply moderately effective to the subject show some and techniques. Apply limited or barely effective or o grasp of the subject. Evidence of little or lac skills and techniques. Organization and presendent course Details 12 sessions x 2 hours 6 sessionsx 2 hours 1 day trip with field project Examples for sedimentary environment course 1 day trip with field project Examples for sedimentary environment course 1 day trip with field project Examples for sedimentary environmentary environme	bilities and logical thinking, with evicy effective organizational and preser al abilities and logical thinking. Appintational skills. The analytical abilities and logical thinking analytical abilities and logical thinking reganizational and presentational skills of analytical abilities and logical thinking reganizational and presentational skills of analytical abilities and logical thational skills are ineffective. The transfer of the tran	lence of original though tational skills. Ily effective lab/fieldwornking. Apply moderatel skills. Apply partially effectivis. Apply partially effectivis. No. of Hours 24 12 8 12 90 Assessment Methods to CLO Mapping	
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A B C D Fail Lecture w Activities Lectures Laborator Field wor Project w Reading of Methods	Demonstrate thorough Apply highly effective Is Demonstrate substanti skills and techniques. A Demonstrate general teffective lab/fieldwork of Demonstrate partial bulab/fieldwork skills and Demonstrate little or neffective lab/fieldwork skills and Demonstrate lab/fieldwork skills and Dem	grasp of the subject. Show strong analytical a ab/fieldwork skills and techniques. Apply highly ial grasp of the subject. Show strong analytical Apply highly effective organizational and prese but incomplete grasp of the subject. Show sor skills and techniques. Apply moderately effective it limited grasp of the subject. Show some antechniques. Apply limited or barely effective or or grasp of the subject. Evidence of little or lacklils and techniques. Organization and present onent course Details 12 sessions x 2 hours 6 sessionsx 2 hours 1 day trip with field project Examples for sedimentary envir	bilities and logical thinking, with evicy effective organizational and preser al abilities and logical thinking. Appintational skills. The analytical abilities and logical thinking appintational skills and presentational and presentational alytical abilities and logical thinking rganizational and presentational skills of analytical abilities and logical thinking rganizational skills are ineffective. The second of the second of the second or the second of the second or the	lence of original though tational skills. Ily effective lab/fieldwornking. Apply moderatel skills. Apply partially effectivis. Apply partially effectivis. No. of Hours 24 12 8 12 90 Assessment Methods to CLO Mapping CLO 1,2,3,4	

EASC3404		al geology (6 cred	its)	Academic Yea		
Offering Department	Earth Scie			Quota	40	
Course Co-ordinator		Earth Sciences (jrali	,			
Teachers Involved		Webb,Earth Sciences] ,Earth Sciences))			
Course Objectives			of rock deformation. Participants	in this course will learn abo	ut the aeometries	
			ock deformation, and how to answ			
	involve he structure.	avy use and generation	on of geological maps and cross	sections and explore their ut	ility for interpretin	
Course Contents		n based: lecture and la	aboratory			
& Topics	Cidoo roon	ir bacca. Iootaro aria it	aboratory			
		on: basics on stress, s	strain, stress-strain relation			
	- Stress	4				
	- Stereone	ion mechanisms				
	- Strain					
	- Joints					
	- Rheology					
		d fault systems ne solutions				
	- Folds	ic solutions				
	- Shear Zo					
	,	foliations, lineations)				
		onal and extensional s hod for cross-section o				
		lly focused map interp				
		cross sections				
	- Key Struc	ctures in HK				
	Fieldwork					
		okfulam Reservoir plu	s an associated day of self-survey	work		
	- Joints - Pokfulam Reservoir plus an associated day of self-survey work - Folds plus - Ma Shi Chau					
			rned fold limb Ma Tso Lung			
Course Learning			course, students should be able to	D:		
Outcomes	CLO 1 CLO 2		derate level rock deformation			
	CLO 2 interpret structural data from a geology map CLO 3 plot and interpret structural data on a stereonet					
	CLO 4		ck and 4D rock-time relationships			
Pre-requisites	Pass in EA	SC2402 and EASC34	·			
(and Co-requisites						
and Impermissible						
combinations) Offer in 2020 - 2021	Y 1st s	sem Offer in 2021 - 2	2022 · V	Examination	Dec	
Grade Descriptors	Α		ubject; evidence of strong critical abilities			
(A+ to F)			miliar situations; highly effective fieldwork s conclusions; integration of the full range of			
	В		ibject; evidence of critical abilities and logic			
			ork skills and techniques; correct use of	data and results to draw appropriat	e conclusions; genera	
	С		nciples, evidence and techniques. rasp of the subject; evidence of some crit	ical abilities and logical thinking; ap	ply knowledge to mos	
			ately effective fieldwork skills and techniq			
	D	results to draw appropriate conclusions; some partial integration of theories, principles, evidence and techniques. Limited grasp of the subject, retention of some relevant information of the subject; evidence of limited critical abilities; limited				
		ability to apply knowledge to solve problems; partially effective fieldwork skills and techniques; limited ability to use data an				
	results to draw appropriate conclusions; limited integration of theories, principles, evidence and techniques. Fail Little or no grasp of the knowledge and understanding of the subject; little or no evidence of critical abilities and coheren					
	thinking; very little or no ability to apply knowledge to solve problems; minimally effective or ineffective fieldwork skills and techniques; misuse of data and results and/or unable to draw appropriate conclusions; little or no or inapt integration of theories					
		principles, evidence and to		<u> </u>		
Course Type		th laboratory compone			No. CII	
Course Teaching & Learning Activities	Activities Lectures		Details eleven 2-hour sessions		No. of Hours 22	
a Louining Activities	Laboratory	V		vith a structural focus	22	
	Field work		3 days field work	stereonets, map interpretation with a structural focus 3 days field work		
	Project wo		additional 1-2 days self directed		24	
			stones showing interesting struc	ctural features		
A	Reading /	Self study	In the state of th	W. L. C. C. C.	50	
Assessment Methods	Methods		Details	Weighting in final	Assessment Methods	
and Weighting				course grade (%)	Methods to CLO Mapping	
	Assignme	nts		60	CLO 1,2,3,4	
	Examinati			40	CLO 1,2,3,4	
Required/recommended	Davis, Rey	nolds & Kluth. 2012.	Structural geology of rocks and reg	ions, 3rd edition. # 551.8 D2.		
			ural geology, # 551.8 S95.			
reading and						
reading and online materials	Twiss & M	oores. 2007. Structura	ll Geology, 2nd edition. # 551.8 T9		.i.a. # 554 0 1/01	
eading and	Twiss & M	oores. 2007. Structura uijm & Marshak. 2004.		structural geology and tector		

EASC3405		mental remote sens	ing (6 credits)	Academic Y		
Offering Department Course Co-ordinator	Earth Scie		siahal@hku hk	Quota	54	
Course Co-ordinator Teachers Involved		alski, Earth Sciences <i>(jm</i> nalski,Earth Sciences)	iiciiai @iiku.iik)			
I SUSTICIO INTOTTO	,	Biological Sciences)				
Course Objectives	This cours	se serves as an introduc	tion to remote sensing of the Earthing visible, infrared, and microwav		course, we will focus	
	scientist.	This course will teach y	data is an essential skill for the ou not only about the fundament sensing data, 2) how to process	als of remote sensing, bu	ut also practical skill	
	results to		ow to report on your results, 5) he			
Course Contents		ation of the fundamental	<u> </u>			
& Topics		otion of key remote sensi obtain data of sites on E	ng platforms, sensers and their purath and other planets	irposes.		
			prrect remote sensing data.			
		interpret remote sensing				
			sensing. You will be an expert in		you work hard.	
			g data with Geographic Informatio o modern problems in geoscience		arv science, and voi	
	science.	apply remote comency :	good	o, omnato colonec, planet	,,	
			er career goals and how to be a pi			
Course Learning			Is into your CV so that you have a		ırket.	
Outcomes	CLO 1		ourse, students should be able to e of how remotely sensed data are			
	CLO 2		techniques of image processing	o doquilod		
	CLO 3	handle remotely sense	d data within geographic informati			
	CLO 4		ely sensed be used for environme	ntal assessment		
	CLO 5	evaluate and interpret				
Pre-requisites	CLO 6	present and discuss res	or EASC2407 or ENVS2002			
and Co-requisites and Impermissible combinations)	1 433 111 6	NOO2404 01 ENGO2400	or EAGGE407 of ENVOEOGE			
Offer in 2020 - 2021	Y 2nd	l sem Offer in 2021 - 2	022 : Y	Examination	n No Exam	
Grade Descriptors	Α		ery of extensive knowledge and skills req			
(A+ to F)		strong analytical and critical abilities and logical thinking, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.				
	В	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Correct use of data and results to draw appropriate conclusions. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities, and limited ability to apply knowledge to solve problems. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.				
	Fail	of analytical and critical abi	ence of command of knowledge and skills ities, logical and coherent thinking. Show and/or unable to draw appropriate conclus	little or no ability to apply know	wledge to solve problems	
Course Type	_	ith laboratory componen				
Course Teaching & Learning Activities	Activities	3	Details		No. of Hours	
A Loanning Activities	Lectures					
	Laborator	·V			24	
	Laborator Project w	•			24 24 12	
	Project w	•			24	
	Project w	ork	Details	Weighting in final course grade (%)	24 12	
	Project w Reading	ork / Self study	Written assignments (weekly)		24 12 100 Assessment Methods	
	Project w Reading / Methods	ork / Self study	Written assignments (weekly) Two in-class examination	course grade (%)	24 12 100 Assessment Methods to CLO Mapping	
and Weighting Required/recommended reading and	Project w Reading A Methods Assignment Test Remote S Author(s)	ork / Self study ents rensing: Principles and A : Floyd F. Sabins	Written assignments (weekly) Two in-class examination (35% each)	course grade (%)	24 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6	
Assessment Methods and Weighting Required/recommended reading and online materials	Project w Reading / Methods Assignment Test Remote S Author(s) Publisher Edition: 3 Print ISBN	ork / Self study ents ensing: Principles and A : Floyd F. Sabins : Waveland Press rd J: 9781577665076, 157	Written assignments (weekly) Two in-class examination (35% each) pplications (3rd edition)	course grade (%)	24 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6	
and Weighting Required/recommended reading and	Project w Reading / Reading / Methods Assignme Test Remote S Author(s) Publisher Edition: 3 Print ISBN eText ISB	ork / Self study ents eensing: Principles and A : Floyd F. Sabins : Waveland Press ord V: 9781577665076, 157 N: 9781478618171.0	Written assignments (weekly) Two in-class examination (35% each) pplications (3rd edition)	course grade (%) 30 70	24 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6	
and Weighting Required/recommended reading and	Project w Reading / Reading / Methods Assignme Test Remote S Author(s) Publisher Edition: 3 Print ISBN eText ISB If you sign the material	ork / Self study ents ents / Sensing: Principles and A : Floyd F. Sabins : Waveland Press rd J: 9781577665076, 157 N: 9781478618171.0	Written assignments (weekly) Two in-class examination (35% each) pplications (3rd edition)	course grade (%) 30 70	24 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6	

EASC3406	Reconstruction of past climate (6 credits)	Academic Year	2020

Offering Department	Earth Scie			Quota		
Course Co-ordinator		Earth Sciences (shli@	hku.hk)			
Teachers Involved	(Dr S H Li	Earth Sciences)				
Course Objectives			th an understanding of how dyna oduces the theory and methods		hanged over the las	
Course Contents	The Quate	ernary period (1),	·			
k Topics		nanges in the last 2.6 m	. ,			
		ces of climate change (,			
	Quantitative reconstruction methods (1) Pollen analysis and biological proxies (2)					
	Climate change in arid regions (1)					
	Quaternary geochronology (1)					
	Climate changes in East Asia (1)					
			an evolution and society (1)			
	Global wa	rming and future climat	e change (1)			
		nange in Asia and Euro	•			
ourse Learning		· · · · · · · · · · · · · · · · · · ·	course, students should be able			
Outcomes	CLO 1		climate change during last 2.6 m			
	CLO 2		g forces of climate changes in di			
	CLO 3 CLO 4		palaeo-environment reconstruct cts of climate changes	ion		
	CLO 4		ret data sets of climate change p	rovies		
Pre-requisites	Pass in EA		riet data sets of climate change p	ioxies		
and Co-requisites	1 433 111 L7	1002401				
and Impermissible						
combinations)						
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : Y		Examination		
Grade Descriptors	Α		stery at an advanced level of extensive			
(A+ to F)		learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.				
	В	Demonstrate substantial co	ommand of a broad range of knowledge			
			evidence of analytical and critical abilities		ply knowledge to familia	
	С	and some unfamiliar situations. Apply effective organizational and presentational skills. Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning				
		outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most				
	D	familiar situations. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcome				
		Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to ap				
	Fail		ns. Apply limited or barely effective orgar idence of command of knowledge and sl		learning outcomes. Lac	
	ган		abilities, logical and coherent thinking.			
			d presentational skills are minimally effec	tive or ineffective.		
Course Type		th laboratory componer				
Course Teaching	Activities	1	Details		No. of Hours	
Learning Activities	Lectures	.,	12 sessions x 2 hours		24 4	
	Laborator Field work	•	1 half-day fieldtrip	2 sessions		
		\	i fiali-day lieldilip		5	
			8 sessions		16	
	Tutorials	Self study	8 sessions		16 90	
Assessment Methods	Tutorials Reading /	Self study		Weighting in final	90	
	Tutorials	Self study	8 sessions Details	Weighting in final course grade (%)	90 Assessment Methods	
	Tutorials Reading /	·			90 Assessment Methods	
	Tutorials Reading / Methods	ents		course grade (%)	90 Assessment Methods to CLO Mapping	
Assessment Methods and Weighting Required/recommended	Tutorials Reading / Methods Assignme Examinati	ents ion		course grade (%) 50 50	90 Assessment Methods to CLO Mapping CLO 1,2,3,5 CLO 1,2,3,4	
and Weighting Required/recommended reading and	Tutorials Reading / Methods Assignme Examinati J.J. Lowe Longman,	ents ion and M.J.C. Walker 1997, 2nd ed)	Details Reconstructing Quaternary Env	course grade (%) 50 50 vironments. (Harlow, Essex	90 Assessment Methods to CLO Mapping CLO 1,2,3,5 CLO 1,2,3,4	
and Weighting Required/recommended eading and	Tutorials Reading / Methods Assignme Examinati J.J. Lowe Longman, W.F. Rudo	ents ion and M.J.C. Walker 1997, 2nd ed) diman: Earths climate: F	Details Reconstructing Quaternary Env	course grade (%) 50 50 vironments. (Harlow, Essex 2nd ed.)	90 Assessment Methods to CLO Mapping CLO 1,2,3,5 CLO 1,2,3,4 : Addison Wesley	
and Weighting	Tutorials Reading / Methods Assignme Examinati J.J. Lowe J.J. Lowe U.F. Rudo D.E. Ande	ents ion and M.J.C. Walker 1997, 2nd ed) diman: Earths climate: F rson, A.S. Goudie and	Details Reconstructing Quaternary Env	course grade (%) 50 50 vironments. (Harlow, Essex 2nd ed.) ts through the Quaternary (O:	90 Assessment Methods to CLO Mapping CLO 1,2,3,5 CLO 1,2,3,4 : Addison Wesley	

EASC3408	Geoph	sics (6 credits)		Academic Year	2020
Offering Department	Earth So	ences		Quota	
Course Co-ordinator	Dr B Zh	ng, Earth Sciences (binzh@hku.hk)			
Teachers Involved		ng,Earth Sciences) Chan,Earth Sciences)			
Course Objectives	geophys	ew of the geophysical characteristics and proce cal disciplines, including seismology, gravity, geo cal methods for studying the earth's interior and nea	othermometry, geon	nagnetism, as we	
Course Contents & Topics	- Geoma	Properties of the Earth			
Course Learning Outcomes	CLO 1 CLO 2 CLO 3 CLO 4	ssful completion of this course, students should be lescribe the approaches and methods geophysicist apply basic techniques in measurements of earthques lescribe the procedure to determine gravity anoma anderstand the methods of paleomagnetism and de lescribe how density, pressure and temperature of	ts use to study the ir lakes and interpret a lies and their interpr escribe the processe	a seismogram etation es of rock magnetis	
Pre-requisites (and Co-requisites	Pass in	ASC2401 or PHYS2250			

and Impermissible combinations)						
Offer in 2020 - 2021	Y 2r	nd sem Offer in 2021 - 2	022 : Y	Examination	No Exam	
Grade Descriptors (A+ to F)	Α	Demonstrated an in-depth understanding of the subject well above the expected level of an university undergraduate and achieving over 80% of total marks and an ability to pursue advance-level study in some of the geophysics subdisciplines.				
(71.101)	В	Demonstrate an understanding of the subject at the appropriate level of a university student and achieving 70% of the total course marks. A greater effort and further preparation are needed if student plans to pursue further study of geophysics.				
	С	Coursework and examination analysis. Achieved 60-70% of	n results reflect only a basic understandi of total course marks.	ng of the subject without the ab	ility to carry out in-depth	
	D		at understanding of the subject as total of student puts in on the subject.	course mark achieved is below	60%. The pass grade is	
	Fail	A total lack of effort and insu	fficient ability to understand the subject an	d failure to achieve 50% of the av	/ailable course marks.	
Course Type	Lecture	with laboratory component	t course			
Course Teaching	Activitie	es	Details		No. of Hours	
& Learning Activities	Lectures		12 sessions x 2 hours		24	
	Laboratory		2 computer exercises, 2 field exercises on exploration geophysical methods		24	
	Reading	g / Self study			100	
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignn	nents	Homework assignments	20	CLO 1,2,3	
	Laborat	ory reports	2 field reports and 2 computer lab report.	80	CLO 1,2,3,4,5	

EASC3409	Igneous	and metamorphic	petrogenesis (6 credits)	Academic Year	2020	
Offering Department	Earth Scier		· · · · · · · · · · · · · · · · · · ·	Quota	30	
Course Co-ordinator	Prof M Sun	, Earth Sciences (min	sun @hku.hk)			
Teachers Involved		ao,Earth Sciences) n,Earth Sciences)	·			
Course Objectives		•	overage of the principles and tech ss and their cause-and-effect rela			
Course Contents & Topics	- Application - Basaltic m - Granitic m - Magmatis - Magmatis - Types of i - Chemical - Metamorp - Metamorp - Metamorp	on of trace elements are nagmatism and mantle nagma and crustal chains at convergent bount and crustal growth metamorphism equilibrium/disequ	aracteristics idaries rium in metamorphism; metamorphi	genesis c phase diagrams (ACF, A'KI	ŕ	
Course Learning	On success	sful completion of this	course, students should be able to:			
Outcomes	CLO 1 use rock associations, textures, structures and geochemical characteristics to infer the petrogenesis of major igneous rocks					
	CLO 2 use magmatic rocks to study the mantle and crustal characteristics					
	CLO 3 apply mineral assemblages, microtextures, mineral reaction relationships and metamorphic P-T paths to					
	infer the tectonothermal evolution of metamorphic rocks					
	CLO 4 demonstrate knowledge and understanding of magmatic and metamorphic processes and their cause-and effect relationships with tectonic settings and crustal evolution					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in EA	SC3402				
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 -	2022 : Y	Examination	May	
Grade Descriptors (A+ to F)	Α	strong analytical and critic	owledge and skills at an advanced level req al abilities and logical thinking, and ability t data and results to draw appropriate and in	o apply highly effective lab skills an	d techniques to solve	
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply effective lab skills and techniques to solve problems. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply moderately effective lab skills and techniques to solve problems. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.				
	D	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities, and limited ability to apply partially effective lab skills and techniques to solve problems. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.				
	Fail	of analytical and critical ab techniques to solve proble	idence of command of knowledge and skills illities, logical and coherent thinking, and abi ems. Misuse of data and results and/or ur nimally effective or ineffective.	ility to apply minimally effective or in	effective lab skills and	
Course Type	Lecture wit	h laboratory compone	nt course			
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				24	
	Laboratory				24	
	Reading /	Self study			100	

and Weighting		course grade (%)	Methods to CLO Mapping
	Assignments	40	CLO 1,2,3,4
	Examination	60	CLO 1,2,3,4
Required/recommended reading and online materials	M.G. Best: Igneous and Metamorp John D Winter: An Introduction to I		

EASC3410	Hydroge	eology (6 credits	<u> </u>	Academic Ye	ar 2020				
Offering Department	Earth Scie	ences		Quota	40				
Course Co-ordinator	Prof J J Jia	ao, Earth Sciences	(jjiao @hku.hk)						
Teachers Involved	(Dr X Luo,	Earth Sciences)	·						
	(Prof J J J	iao,Earth Sciences)						
Course Objectives	This cours	se aims to introduce	some basic concepts and theories	of groundwater flow with speci	al reference to ca				
•	studies in	HK. It consists of	three components: 1) fundamental	s of groundwater physics; 2)	well hydraulics ar				
			s a resource; and 3) influence of						
	engineerin	•	,	0					
Course Contents		-	Budgets, Introduction to Hydrogeological	gy (1 Week)					
& Topics		Of Aquifers (2 Wee		,					
•	Hydraulic I	head and flow net(2	2 Weeks)						
		ations of Groundwa							
	Groundwa	ter Flow To Wells (1 Week)						
		Of Aguifer Test(2 We							
	Well instal	llation & pumping te	est design(1 Week)						
	Regional C	Groundwater Flow S	Systems (HK case study)(1 Week)						
			China case study)(Week 12)						
Course Learning			this course, students should be able	to:					
Outcomes			ance of hydrogeology in geotechnic		ina				
			cepts of hydrological cycle and wa						
		id surface water	icopie el ligarelegical eyele alla lia		oo g.ouuirui				
			elationship between groundwater s	vstem and geology and topogr	anhv				
			cepts of aquifer and aquifer proper						
		groundwater flow	icepts of aquiler and aquiler proper	ics, riyaradiic ricad, now rict, a	and basic principi				
		•	r tests to estimate some important a	guifer parameters					
)		•	tests to estimate some important a	quilei parameters					
Pre-requisites	Pass in EA	4502402							
and Co-requisites									
and Impermissible									
combinations) Offer in 2020 - 2021	Y 1st	sem Offer in 202	1 2022 · V	Examination	Dec				
Grade Descriptors			n mastery at an advanced level of extensiv						
(A+ to F)	Α		now strong analytical and critical abilities and						
(A: to 1)			a wide range of complex practical problems.						
	В		ial command of a broad range of knowledg						
					learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to mos				
		practical problems. Apply effective organizational and presentational skills. Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning							
		Demonstrate general	but incomplete command of knowledge a						
	С		but incomplete command of knowledge a ence of some analytical and critical abilities	nd skills required for attaining most	of the course learning				
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	D	outcomes. Show evide practical problems. Ap Demonstrate partial be Show evidence of som knowledge to solve pra	ence of some analytical and critical abilities ply moderately effective organizational and p ut limited command of knowledge and skills	nd skills required for attaining most and logical thinking, and ability to ap oresentational skills. required for attaining some of the co ted analytical and critical abilities. Sho ctive organizational and presentational	of the course learning oply knowledge to son urse learning outcome by limited ability to applicable.				
		outcomes. Show evide practical problems. Ap Demonstrate partial bi Show evidence of som knowledge to solve pra Demonstrate little or n of analytical and critica	ence of some analytical and critical abilities ply moderately effective organizational and put ut limited command of knowledge and skills ne coherent and logical thinking, but with lim actical problems. Apply limited or barely effer o evidence of command of knowledge and sa al abilities, logical and coherent thinking. Sh	nd skills required for attaining most and logical thinking, and ability to ap oresentational skills. required for attaining some of the co ited analytical and critical abilities. She ctive organizational and presentational skills required for attaining the course ow very little or no ability to apply kno	of the course learning opply knowledge to son urse learning outcome ow limited ability to apple skills.				
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Course Teaching	D Fail Lecture wi Activities Lectures Laborator Field work	outcomes. Show evide practical problems. Ap Demonstrate partial but Show evidence of som knowledge to solve practical problems. Organizatio ith laboratory composition of the problems of the laboratory composition of the laboratory composition.	ence of some analytical and critical abilities ply moderately effective organizational and put limited command of knowledge and skills ne coherent and logical thinking, but with limited command of knowledge and sall abilities, logical and coherent thinking. Shon and presentational skills are minimally effective to course Details 12 sessions x 2 hours 10 x 2 hours 10 x 2 hours	nd skills required for attaining most and logical thinking, and ability to ap oresentational skills. required for attaining some of the co ited analytical and critical abilities. She ctive organizational and presentational skills required for attaining the course ow very little or no ability to apply kno	of the course learning oply knowledge to son urse learning outcome own limited ability to apply skills. It is also to solve practice. No. of Hours 24 20				
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Course Teaching & Learning Activities	Pail Lecture wire Activities Lectures Laboratory Field work Reading /	outcomes. Show evide practical problems. Ap Demonstrate partial bit Show evidence of son knowledge to solve problems. Ap Demonstrate little or nof analytical and critical problems. Organizatio ith laboratory composition of the composition of	ence of some analytical and critical abilities ply moderately effective organizational and put limited command of knowledge and skills ne coherent and logical thinking, but with limited command of knowledge and sall abilities, logical and coherent thinking. Shoth and presentational skills are minimally effective to evidence of command of knowledge and sal abilities, logical and coherent thinking. Shoth and presentational skills are minimally effective to the course to be a session of the command of the course to the course to the course to the course to the course the course the course that the course the course that the course th	nd skills required for attaining most and logical thinking, and ability to appresentational skills. required for attaining some of the cotted analytical and critical abilities. Shatitive organizational and presentational skills required for attaining the course ow very little or no ability to apply knorctive or ineffective.	of the course learning opply knowledge to son urse learning outcome with limited ability to apply skills. Idearning outcomes. Lawledge to solve practice. No. of Hours 24 20 5 100 Assessment Methods				
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Course Teaching Learning Activities Assessment Methods and Weighting	Fail Lecture wire Activities Lectures Laboratory Field work Reading / Methods Assignme Examinati	outcomes. Show evide practical problems. Ap Demonstrate partial bis Show evidence of son knowledge to solve problems. Demonstrate little or nof analytical and critical problems. Organization the laboratory composition of the laboratory composition of the laboratory composition. Self study	ence of some analytical and critical abilities ply moderately effective organizational and put limited command of knowledge and skills ne coherent and logical thinking, but with lim actical problems. Apply limited or barely effective or evidence of command of knowledge and sall abilities, logical and coherent thinking. Shrin and presentational skills are minimally effective onent course Details 12 sessions x 2 hours 10 x 2 hours Half day field trip	nd skills required for attaining most and logical thinking, and ability to appresentational skills. required for attaining some of the cotted analytical and critical abilities. Shotive organizational and presentational skills required for attaining the course ow very little or no ability to apply knototive or ineffective. Weighting in final course grade (%) 30 70	of the course learning oply knowledge to son urse learning outcome ow limited ability to apply skills. It is a solve practice. It is a solve practice of the solve practice of t				
Course Teaching Learning Activities Assessment Methods and Weighting	Fail Lecture wire Activities Lectures Laboratory Field work Reading / Methods Assignme Examinati	outcomes. Show evide practical problems. Ap Demonstrate partial bis Show evidence of son knowledge to solve problems. Demonstrate little or nof analytical and critical problems. Organization the laboratory composition of the laboratory composition of the laboratory composition. Self study	ence of some analytical and critical abilities ply moderately effective organizational and put limited command of knowledge and skills ne coherent and logical thinking, but with limited command of knowledge and sall abilities, logical and coherent thinking. Shoth and presentational skills are minimally effective to evidence of command of knowledge and sal abilities, logical and coherent thinking. Shoth and presentational skills are minimally effective to the course to be a session of the command of the course to the course to the course to the course to the course the course the course that the course the course that the course th	nd skills required for attaining most and logical thinking, and ability to appresentational skills. required for attaining some of the cotted analytical and critical abilities. Shotive organizational and presentational skills required for attaining the course ow very little or no ability to apply knototive or ineffective. Weighting in final course grade (%) 30 70	of the course learning opply knowledge to son urse learning outcomes we limited ability to appressible. It is will be a solve practice. It is will be a solve				

EASC3412	Earth resources (6 credits)	Academic Year	2020
Offering Department	Earth Sciences	Quota	40
Course Co-ordinator	Prof M F Zhou, Earth Sciences (mfzhou@hku.hk)		
Teachers Involved	(Prof G Zhao,Earth Sciences) (Prof M F Zhou,Earth Sciences)		
Course Objectives	To provide students with knowledge about the classification of mineral dep understand the processes that lead to their formation; to gain hand on expe addition, students should gain knowledge about the world wide distributions of n	rience with minin	g procedures. In
Course Contents & Topics	Concepts in mineral deposits and mining industrial; exploration and mining deposit, mineral deposit models, magmatic oxide and sulfide deposits, sk volcanogenic massive sulfide deposits, coal, oil and gas, resource evaluation.	,	
Course Learning	On successful completion of this course, students should be able to:		

Outcomes	CLO 1	understand the terminological	ogy and nomenclature in t	he mining industrial and mineral dep	osits	
	CLO 2	understand factors that a	are key to the formation of	f metallic and industrial resources		
	CLO 3	understand the controls	of earth resources in a glo	obal scale		
	CLO 4	understand methods of e	exploration and exploitatio	n for mineral deposits		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	EASC2402 or EASC3402	2			
Offer in 2020 - 2021	Y 1s	t sem Offer in 2021 - 2	022 : Y	Examination	Dec	
Grade Descriptors (A+ to F)	A	course learning outcomes.	. Show strong analytical and o	I of extensive knowledge and skills with evid critical abilities and logical thinking. Eviden- phly effective organization and presentation sl	ce of original thoughts,	
	В					
	С	C Demonstrate general but incomplete understanding required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking. Moderately effective organization and presentation skills.				
	Demonstrate partial but limited understanding for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	No or little knowledge about the subject. No evidence for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Very little or no ability for field observation and for solving problems. Poor organization and presentational skills.				
Course Type	Lecture v	with laboratory componer	nt course			
Course Teaching	Activitie	es	Details		No. of Hours	
& Learning Activities	Lectures	3	2 hour lectures per week for 10 weeks		20	
	Laborato	ory			20	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examina	ation		70	CLO 1,2,3,4	
	Laborato	ory reports		30	CLO 1,2,4	
Required/recommended reading and online materials	TBC					

EASC3413	Enginee	ering geology (6 cred	aits)	Academic Yea	2020
Offering Department	Earth Scie	ences	•	Quota	35
Course Co-ordinator	Dr L N Y	Wong, Earth Sciences (I	nywong@hku.hk)		
Teachers Involved	(Dr L N Y	Wong, Earth Sciences)	· · ·		
		Jiao,Earth Sciences)			
Course Objectives	To preser	nt some of the concepts	and skills of importance in the prof	fession of Engineering Geo	logy and illustrat
-	their use l	by case histories.			
Course Contents & Topics	(air photo		n and the role of the Engineering Go rock description, engineering geol		
Course Learning	On succe	ssful completion of this of	course, students should be able to:		
Outcomes			ineering design is carried out and cularly the economic- and safety-cri		the geologist or
			geological models and understand design should be carried out	how desk study, site recor	naissance surve
		arry out simple air photo or engineering purposes	interpretation tasks and elementar	y soil and rock description	and classification
			f slope failures and basic methods to		
		arry out stability analyse nethod	es using methods such as the lim	nit equilibrium and stereog	raphic projection
)	D : E	ACC0140 EACC044	A		
and Co-requisites and Impermissible		ASC3410 and EASC341 se is only for final year s	4, or already enrolled in these cours tudents.	ses	
and Co-requisites and Impermissible combinations)	This cours		tudents.	ses Examination	May
Pre-requisites and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	This cours	d sem Offer in 2021 - 2 Demonstrate thorough mas learning outcomes. Show si	tudents. 2022 : Y stery at an advanced level of extensive knot trong analytical and critical abilities and logic is to solve a wide range of complex, familiar	Examination by by ledge and skills required for a call thinking, with evidence of original controls.	ttaining all the cours
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	This cours	d sem Offer in 2021 - 2 Demonstrate thorough mas learning outcomes. Show si to apply knowledge and skil organizational and presenta Demonstrate substantial co learning outcomes. Show every service of the state of	tudents. 2022 : Y Stery at an advanced level of extensive knot trong analytical and critical abilities and logic Is to solve a wide range of complex, familiar tional skills. mmand of a broad range of knowledge and vidence of analytical and critical abilities and	Examination owledge and skills required for a cal thinking, with evidence of origi and unfamiliar practical problems skills required for attaining at lea logical thinking, and ability to app	ttaining all the cours nal thought, and abili . Apply highly effective ast most of the cours y knowledge and skil
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	This cours	d sem Offer in 2021 - 2 Demonstrate thorough mas learning outcomes. Show si to apply knowledge and skil organizational and presenta Demonstrate substantial co learning outcomes. Show even to solve familiar and some under the control of the contr	tudents. 2022 : Y Stery at an advanced level of extensive knot trong analytical and critical abilities and logic lis to solve a wide range of complex, familiar tional skills. mmand of a broad range of knowledge and vidence of analytical and critical abilities and infamiliar practical problems. Apply effective incomplete command of knowledge and skills some analytical and critical abilities and log some analytical and critical abilities and log	Examination by by by and skills required for a grain thinking, with evidence of originand unfamiliar practical problems skills required for attaining at leading thinking, and ability to apporganizational and presentational lills required for attaining most origical thinking, and ability to apply the statement of the statement	ttaining all the cours nal thought, and abili . Apply highly effective ast most of the cours y knowledge and skil skills. If the course learning cnowledge and skills in
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	This cours Y 2nd A B	d sem Offer in 2021 - 2 Demonstrate thorough male learning outcomes. Show st to apply knowledge and skil organizational and presental Demonstrate substantial collearning outcomes. Show et to solve familiar and some under the content of the conte	tudents. 2022 : Y Stery at an advanced level of extensive knot trong analytical and critical abilities and logic ls to solve a wide range of complex, familiar tional skills. Immand of a broad range of knowledge and vidence of analytical and critical abilities and infamiliar practical problems. Apply effective incomplete command of knowledge and sk of some analytical and critical abilities and log unfamiliar, practical problems. Apply moderat ited command of knowledge and skills required the command of knowledge and skills required the command of knowledge and skills requirement and logical thinking, but with limited ar	Examination by by by a construction of the court of the	ttaining all the cours nal thought, and abili. Apply highly effective ast most of the cours y knowledge and skil skills. If the course learning cowledge and skills esentational skills. se learning outcome: I limited ability to app
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	This cours Y 2nd A B C	d sem Offer in 2021 - 2 Demonstrate thorough mas learning outcomes. Show si to apply knowledge and skill organizational and presenta Demonstrate substantial co learning outcomes. Show et to solve familiar and some ut osolve familiar and some ut outcomes. Show evidence cosolve most familiar, but not in Demonstrate partial but limi Show evidence of some colknowledge and skills to solve Demonstrate little or no evice of analytical and critical ab	tudents. 2022: Y stery at an advanced level of extensive knot trong analytical and critical abilities and logic is to solve a wide range of complex, familiar tional skills. mmand of a broad range of knowledge and widence of analytical and critical abilities and infamiliar practical problems. Apply effective encomplete command of knowledge and skilf some analytical and critical abilities and log unfamiliar, practical problems. Apply moderat ted command of knowledge and skills required.	Examination owledge and skills required for a cal thinking, with evidence of origi and unfamiliar practical problems skills required for attaining at lea logical thinking, and ability to apport original required for attaining most co- gical thinking, and ability to apply I tely effective organizational and preed for attaining some of the coun alytical and critical abilities. Show barely effective organizational ar equired for attaining the course le very little or no ability to apply k	ttaining all the cours nal thought, and abili. Apply highly effective ast most of the cours y knowledge and skil skills. If the course learnin knowledge and skills esentational skills. se learning outcome: I limited ability to app d presentational skills arning outcomes. Lac
and Co-requisites nd Impermissible ombinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	This cours Y 2nd A B C D	d sem Offer in 2021 - 2 Demonstrate thorough mas learning outcomes. Show si to apply knowledge and skill organizational and presenta Demonstrate substantial co learning outcomes. Show et to solve familiar and some ut osolve familiar and some ut outcomes. Show evidence cosolve most familiar, but not in Demonstrate partial but limi Show evidence of some colknowledge and skills to solve Demonstrate little or no evice of analytical and critical ab	tudents. 2022 : Y Stery at an advanced level of extensive knot trong analytical and critical abilities and logic ls to solve a wide range of complex, familiar tional skills. Immand of a broad range of knowledge and vidence of analytical and critical abilities and infamiliar practical problems. Apply effective incomplete command of knowledge and skills some analytical and critical abilities and logunfamiliar, practical problems. Apply moderat ited command of knowledge and skills requirement and logical thinking, but with limited are familiar practical problems. Apply limited or dence of command of knowledge and skills retilities, logical and coherent thinking. Show attion and presentational skills are minimally experts.	Examination owledge and skills required for a cal thinking, with evidence of origi and unfamiliar practical problems skills required for attaining at lea logical thinking, and ability to apport original required for attaining most co- gical thinking, and ability to apply I tely effective organizational and preed for attaining some of the coun alytical and critical abilities. Show barely effective organizational ar equired for attaining the course le very little or no ability to apply k	ttaining all the cours nal thought, and abili. Apply highly effective ast most of the cours y knowledge and skil skills. If the course learnin knowledge and skills esentational skills. se learning outcome: I limited ability to app d presentational skills arning outcomes. Lac
and Co-requisites nd Impermissible ombinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	This cours Y 2nd A B C D	d sem Offer in 2021 - 2 Demonstrate thorough mas learning outcomes. Show si to apply knowledge and skil organizational and presenta Demonstrate substantial co learning outcomes. Show event to solve familiar and some uper to solve familiar and some uper to solve familiar and some uper to solve most familiar, but not obe most familiar title or solve familiar title or no evice of analytical and critical ab practical problems. Organiz, with laboratory components	tudents. 2022 : Y Stery at an advanced level of extensive knot trong analytical and critical abilities and logic ls to solve a wide range of complex, familiar tional skills. Immand of a broad range of knowledge and vidence of analytical and critical abilities and infamiliar practical problems. Apply effective incomplete command of knowledge and skills some analytical and critical abilities and logunfamiliar, practical problems. Apply moderat ited command of knowledge and skills requirement and logical thinking, but with limited are familiar practical problems. Apply limited or dence of command of knowledge and skills retilities, logical and coherent thinking. Show attion and presentational skills are minimally experts.	Examination owledge and skills required for a cal thinking, with evidence of origi and unfamiliar practical problems skills required for attaining at lea logical thinking, and ability to apport original required for attaining most co- gical thinking, and ability to apply I tely effective organizational and preed for attaining some of the coun alytical and critical abilities. Show barely effective organizational ar equired for attaining the course le very little or no ability to apply k	ttaining all the cours nal thought, and abili. Apply highly effective ast most of the cours y knowledge and skil skills. If the course learnin knowledge and skills esentational skills. se learning outcome: I limited ability to app d presentational skills arning outcomes. Lac
and Co-requisites and Impermissible ombinations) offer in 2020 - 2021 oracle Descriptors (A+ to F) course Type course Teaching	This cours Y 2nd A B C D Fail	d sem Offer in 2021 - 2 Demonstrate thorough malearning outcomes. Show sit to apply knowledge and skil organizational and presenta Demonstrate substantial colearning outcomes. Show evento solve familiar and some under the solve familiar and some under the solve familiar and some under the solve most familiar, but not on Demonstrate partial but in outcomes. Show evidence of solve most familiar, but not under the solve most familiar, but not under the solve most familiar, but not under the solve most familiar in the solve most fa	tudents. 2022 : Y Stery at an advanced level of extensive knot frong analytical and critical abilities and logic lis to solve a wide range of complex, familiar tional skills. mmand of a broad range of knowledge and vidence of analytical and critical abilities and infamiliar practical problems. Apply effective incomplete command of knowledge and skills some analytical and critical abilities and log unfamiliar, practical problems. Apply moderat ited command of knowledge and skills requirement and logical thinking, but with limited are familiar practical problems. Apply limited or dence of command of knowledge and skills relitities, logical and coherent thinking. Show vation and presentational skills are minimally extremely.	Examination owledge and skills required for a cal thinking, with evidence of origi and unfamiliar practical problems skills required for attaining at lea logical thinking, and ability to apport original required for attaining most co- gical thinking, and ability to apply I tely effective organizational and preed for attaining some of the coun alytical and critical abilities. Show barely effective organizational ar equired for attaining the course le very little or no ability to apply k	ttaining all the cours nal thought, and abili. Apply highly effective ast most of the cours y knowledge and skil skills. If the course learning conveledge and skills as esentational skills as se learning outcome. I limited ability to app d presentational skills arming outcomes. Lac nowledge and skills to a powledge and skills a powledge and skills to a powledge and skills to a powledge and skills to a powledge and skills a powledge a powledge and skills a powledge a powledge a powledge a powledge a powledge a powledge a powledge a p
and Co-requisites nd Impermissible ombinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	This cours Y 2nd A B C D Fail Lecture w Activities	d sem Offer in 2021 - 2 Demonstrate thorough malearning outcomes. Show sit to apply knowledge and skil organizational and presental Demonstrate substantial colearning outcomes. Show evento solve familiar and some under the solve familiar and some under the solve familiar and some under the solve familiar, but not under the solve most familiar, but not under the solve most familiar, but not under the solve most familiar, but not under the solve most familiar, but not under the solve most familiar in the solve dealers of the solve most familiar in the solv	tudents. 2022 : Y Stery at an advanced level of extensive knot frong analytical and critical abilities and logic lis to solve a wide range of complex, familiar tional skills. mmand of a broad range of knowledge and vidence of analytical and critical abilities and infamiliar practical problems. Apply effective incomplete command of knowledge and skills some analytical and critical abilities and log unfamiliar, practical problems. Apply moderat ited command of knowledge and skills requirement and logical thinking, but with limited are familiar practical problems. Apply limited or dence of command of knowledge and skills relitities, logical and coherent thinking. Show vation and presentational skills are minimally extremely.	Examination owledge and skills required for a cal thinking, with evidence of origi and unfamiliar practical problems skills required for attaining at lea logical thinking, and ability to apport original required for attaining most co- gical thinking, and ability to apply I tely effective organizational and preed for attaining some of the coun alytical and critical abilities. Show barely effective organizational ar equired for attaining the course le very little or no ability to apply k	ttaining all the cours nal thought, and abili. Apply highly effective ast most of the cours y knowledge and skills skills. If the course learning converge and skills esentational skills see learning outcome: I limited ability to app d presentational skills arning outcomes. Lac nowledge and skills to the course of the cours
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	This cours Y 2nd A B C D Fail Lecture w Activities Lectures	d sem Offer in 2021 - 2 Demonstrate thorough male learning outcomes. Show sit to apply knowledge and skil organizational and presental Demonstrate substantial colearning outcomes. Show evit to solve familiar and some u Demonstrate general but in outcomes. Show evidence of some colk knowledge and skills to solve familiar, but not up to the college of some colk knowledge and skills to solve Demonstrate little or no evit of analytical and critical problems. Organizatift laboratory components	tudents. 2022 : Y Stery at an advanced level of extensive knot frong analytical and critical abilities and logic lis to solve a wide range of complex, familiar tional skills. mmand of a broad range of knowledge and vidence of analytical and critical abilities and infamiliar practical problems. Apply effective incomplete command of knowledge and skills some analytical and critical abilities and log unfamiliar, practical problems. Apply moderat ited command of knowledge and skills requirement and logical thinking, but with limited are familiar practical problems. Apply limited or dence of command of knowledge and skills relitities, logical and coherent thinking. Show vation and presentational skills are minimally extremely.	Examination owledge and skills required for a cal thinking, with evidence of origi and unfamiliar practical problems skills required for attaining at lea logical thinking, and ability to apport original required for attaining most co- gical thinking, and ability to apply I tely effective organizational and preed for attaining some of the coun alytical and critical abilities. Show barely effective organizational ar equired for attaining the course le very little or no ability to apply k	ttaining all the cours all thought, and abilit. Apply highly effective ast most of the cours y knowledge and skills. If the course learning incovered and skills are learning outcomes. I limited ability to app depresentational skills arning outcomes. Laciowledge and skills to the course learning outcomes.

Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments	including field report	30	CLO 2,3,4,5
	Examination		70	CLO 1,2,3,4,5
Required/recommended reading and online materials	Goodman, R. E.: Engineering Ge	ology (Wiley, 1993).		

EASC3414	Soil and	rock mechan	ics (6 credits	5)		Academic Yea	ır 2020
Offering Department	Earth Scie	ences	•	•		Quota	40
Course Co-ordinator	Prof J J Ji	ao, Earth Scienc	es (jjiao@hku.h	k)			
Teachers Involved		(Dr L N Y Wong, Earth Sciences)					
011	(Prof J J Jiao,Earth Sciences) To provide a basic knowledge of soil and rock mechanics for those wishing to consider further studies on a career						
Course Objectives	in enginee	ering geology/geo	otechnics.			•	
Course Contents & Topics	strength a		a, initial stresses			nerals; pore pressure a mation; consolidation;	
Course Learning	On succe	n successful completion of this course, students should be able to:					
Outcomes	CLO 1 ur					and effective stress, s	trength and failure
	CLO 2 ur	nderstand basic p	properties and c	assifications c	f soil and rock		
	CLO 3 ap	preciate the pro	cess of rock def	ormation and s	soil consolidation		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	Pass in EASC3410, or already enrolled in this course					
Offer in 2020 - 2021	Y 2nd	sem Offer in 2	2021 - 2022 : Y			Examination	May
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking. Apply highly effective organizational and presentational skills.						
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply limited or barely effective organizational and presentational skills.					
	Fail					ed for attaining the course I and presentational skills a	
Course Type	Lecture w	ith laboratory cor	mponent course				
Course Teaching	Activities	3	Details	i			No. of Hours
& Learning Activities	Lectures					24	
	Laborator	У					24
	Reading /	Self study					100
Assessment Methods and Weighting	Methods		Details	i		Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignme	ents				30	CLO 1,2,3
	Examinat	ion				70	CLO 1,2,3
Required/recommended reading and online materials					Viley & Sons, 198	39)	

EASC3415	Meteorology (6 credits)	Academic Year	2020			
Offering Department	Earth Sciences	Earth Sciences Quota				
Course Co-ordinator	Dr Jed Kaplan, Earth Sciences (jkaplan@hku.hk)					
Teachers Involved	(Dr J O Kaplan,Earth Sciences)					
Course Objectives	This course will cover the five major components of meteorology: (1) thermodynamics, (2) physical meteorology, (3) observation and analysis, (4) dynamics, and (5) weather systems (cyclones, fronts, thunderstorms). The aim is to provide students with a modern understanding of drivers and behavior of weather by examining the processes that govern atmospheric structure and behavior, weather elements, and weather systems.					
Course Contents & Topics	- Atmospheric Basics - Solar & Infrared Radiation - Thermodynamics - Water Vapor - Atmospheric Stability - Clouds - Precipitation Processes - Satellites & Radar - Weather Reports & Map Analysis - Atmospheric Forces & Winds - General Circulation - Fronts & Air Masses - Thunderstorm Fundamentals - Thunderstorm Hazards - Tropical Cyclones					

Course Learning	On succe	ssful completion of this c	ourse, students should be able to:				
Outcomes	CLO 1 describe key aspects of weather phenomena						
	CLO 2	CLO 2 explain essential elements of atmospheric processes governing weather					
	CLO 3	apply physical principles	to construct models for some bas	sic aspects of weather			
	CLO 4	explain synoptic charts ((weather maps)				
	CLO 5	interpret Hong Kong we	ather (typhoons etc.)				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	Pass in EASC2404					
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20)22 : Y	Examination	No Exam		
Grade Descriptors (A+ to F)	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Demonstrate critical use of data and results to draw appropriate and insightful conclusions. Show insightful use and critical analysis / evaluation of information drawn from a full range of high quality sources and to quote/reference aptly.					
	В	learning outcomes. Show ev and some unfamiliar situation	mmand of a broad range of knowledge ar idence of analytical and critical abilities an ins. Demonstrate correct use of data and sources and ability to make meaningful	d logical thinking, and ability to a results to draw appropriate cond	pply knowledge to familiar clusions. Show critical use		
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Demonstrate mostly correct but some erroneous use of data and results to draw appropriate conclusions. Show use of relevant information from sources and ability to make comparisons between different interpretations and to quote/reference aptly.					
	D						
	Fail	of analytical and critical ab	ence of command of knowledge and skills illities, logical and coherent thinking. Sho suse of data and results and/or unable ritical comparison of them.	ow very little or no ability to a	pply knowledge to solve		
Course Type	Lecture-b	ased course					
Course Teaching	Activitie	S	Details		No. of Hours		
& Learning Activities	Lectures				4		
	Project w	ork ork			48		
	Tutorials			10			
	Discussion	on		14			
		/ Self study			50		
	Assessm	ent			2		
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	problem sets	15	CLO 1,2,3		
	Presenta	tion	in-class presentations (weather reports)	15	CLO 1,4,5		
	Project re	eport	research report	40	CLO 1,4,5		
	Test		midterm examination (1h50)	30	CLO 1,2,3		
Required/recommender reading and online materials	Dept. https://mo	of Earth, Ocean	ology: An Algebra-based Survey & Atmospheric Sciences, p/2646870/mod_resource/content	University of Br	itish Columbia.		

EASC3416	Advanced geochemistry and geochronology (6 credits)	Academic Year	2020				
Offering Department	Earth Sciences Quota 50						
Course Co-ordinator	Prof M F Zhou, Earth Sciences (mfzhou@hku.hk)						
Teachers Involved							
Course Objectives	To present key concepts of modern geochemistry and geochronology and their application to environmental and Earth science problems.						
Course Contents & Topics	Principles of radiogenic isotopic dating and modern instruments Zircon U-Pb isotopic dating and its application Principles and techniques for dating mineral deposits Introduction to Quaternary geochronology Principle, development and applications of Luminescence dating						
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 demonstrate knowledge of concepts and ideas of modern geochemistry						
	CLO 2 explain principles of radiogenic isotopic dating						
	CLO 3 understand how modern analytical techniques are applied to dating earth materials						
	CLO 4 understand how geochemical methods are applied to gain insight into process in environmental and Earth sciences						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in EASC2401 or EASC2406 or EASC2407						
Offer in 2020 - 2021	N Offer in 2021 - 2022 : N	Examination					
Grade Descriptors (A+ to F)	A Student demonstrates thorough mastery at an advanced level of extensive kno learning outcomes. Shows strong analytical and critical abilities and logical thi ability to apply his/her knowledge to a wide range of problems in geochemist knowledge in geochemistry to understand the interactions among minerals, flu fluxes of materials over geological time periods and on a global scale. Studorganizat-ional and presentational skills.	nking, with evidence of orig try, and at the same, can c lids and gases and how the	inal thought, and the combine fundamental se processes impact				
	B Student demonstrates substantial command of a broad range of knowledge an course learning outcomes. Show evidence of analytical and critical abilities and						

	range of problems in geochemistry, and at the same combine knowledge in geochemistry to understand material fluxes amon minerals, fluids and gases over geological time periods and on a global scale. Student shows the ability to apply effective organizational and presentational skills.						
	С	Student demonstrates general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply his/her knowledge to a range of problems in geochemistry and how interactions among minerals, fluids and gases impact material fluxes on a global scale. Student shows the ability to apply moderately effective organizational and presentational skills.					
	D	Student demonstrates partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to understand key topics in geochemistry and limited capability to transfer this knowledge to geological phenomena. Student shows the ability to apply limited or barely effective organizational and presentational skills.					
	Fail	outcomes. Lack of analytica to understand basic topics	or no evidence of command of knowledg I and critical abilities, logical and coherent th s related to the geochemistry and the ap onal skills are minimally effective or ineffectiv	inking. Shows very little or no application of these principles	ability to apply knowledge		
Course Type	Lecture wi	ith laboratory componen	t course				
Course Teaching	Activities		Details	No. of Hours			
& Learning Activities	Lectures			24			
	Laboratory		Up to 24 hours	24			
	Group work			24			
	Discussion		Up to 24 hours	24			
	Reading / Self study				60		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examinat	ion	One 2-hour written examination	60	CLO 1,2,3,4		
	Presentation			20	CLO 1,2,3,4		
	Project report			20	CLO 1,2,3,4		
Required/recommended reading and online materials	Geochem	istry by William M. White	e (Wuley, Apr 1, 2013)				

EASC3417	Earth th	rough time (6 cr	edits)	Academic Yea	ar 2020			
Offering Department	Earth Sci	ences	·	Quota				
Course Co-ordinator	Dr S C C	hang, Earth Sciences	s (suchin@hku.hk)					
Teachers Involved		(Dr N R McKenzie,Earth Sciences)						
		Chang,Earth Science						
Course Objectives	fossil reco	ord and the integration of an understanding of	on of Earth Systems and pla f the evolution of Earth and li		of our place in th			
Course Contents & Topics	such as	Geological time, the origin of life, fossils and diversification of life through time, Important events in Earth history such as Snowball Earth, the Cambrian explosion of life, the Permian/Triassic mass extinction, the Cretaceous Tertiary extinction event, the origins of humans						
Course Learning	On succe	ssful completion of the	his course, students should b	e able to:				
Outcomes	CLO 1	define basic geologic	al principles					
	CLO 2	explain critical geolog	gical relationships					
	CLO 3	outline the history of	the development of our plane	et				
	CLO 4	nterpret the geologic	al record of evolution through	h time				
	CLO 5	compare and contras	t various hypotheses put for	ward to explain major events in Earth	history			
	CLO 6	describe major fossil	groups					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	Pass in EASC3403						
Offer in 2020 - 2021	Y 1st	sem Offer in 2021	- 2022 : Y	Examination	Dec			
Grade Descriptors (A+ to F)	A Show strong analytical and critical abilities and logical thinking, with evidence of original thought. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills. Attend all the laboratory classes; showing strong ability in experiments, data processing and analysis; presenting lab reports with accurate language and correct results.							
	B Evidence of analytical and critical abilities and logical thinking. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills. Attend all the laboratory classes; showing ability in experiments, data processing and analysis; presenting lab reports with correct results.							
	C Evidence of some analytical and critical abilities and logical thinking. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills. Attend most of the laboratory classes; showing ability in experiments, data processing and analysis; presenting lab reports with mostly correct results.							
	D Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills. Attend >50% of the laboratory classes; showing ability in experiments, data processing and analysis; presenting lab reports with acceptable results.							
	Fail	to draw appropriate co	nclusions. Organization and present	ogical and coherent thinking. Misuse of data a lational skills are minimally effective or ineffect perly use computer and software for data proce	ive. Miss more than ha			
Course Type	Lecture w	ith laboratory compo	nent course					
Course Teaching	Activitie	S	Details		No. of Hours			
& Learning Activities	Lectures			24				
	Laborato	ry			12			
	Project work				12			
	Reading / Self study				90			
Assessment Methods and Weighting	Methods	• • • • • • • • • • • • • • • • • • •	Details	Weighting in final course grade (%)	Assessment Methods			
g					to CLO Mapping			
	Examina	tion		40	CLO 1,2,3,4,5,6			

	Presentation	Group Presentation	20	CLO 2,3,4,5
	Test	MCQ Test	20	CLO 2,4,5
Required/recommended reading and online materials	Stanley, S. M and Luczaj, J. A.: Ea	arth System History (4th Edition)		

EASC3418	Coasts	and coastal chang	ge (6 credits)	Academic Yea	r 2020	
Offering Department	Earth Sci	ences		Quota		
Course Co-ordinator	Dr N Kha	in, Earth Sciences (ns.	khan @hku.hk)			
Teachers Involved	\ \	an,Earth Sciences)				
		Zong, Earth Sciences)				
Course Objectives	fieldtrips. human d	Teaching material co	overs short-term to long-terr	al systems through classroom studies n processes of different coastal sys n, and economic development and i	stems, natural and	
Course Contents & Topics	- Major co - Natural - Coastal - Human	The content of this course includes: - Major coastal environments: rocky coast, beaches and dunes, lagoons, estuaries, river deltas - Natural drivers for coastal processes: wave, tide, coastal currents, freshwater and sediment discharge - Coastal processes: sediment transport and deposition, biological activity - Human drivers for coastal change: settlements, infrastructures and coastal hazards - Short and long term coastal change: storms, climate and sea-level change				
Course Learning			is course, students should be			
Outcomes	CLO 1		geomorphological processe			
	CLO 2	Assess quantitatively				
	CLO 3	Demonstrate knowle	dge of weathering processes	s and relationship to climate		
	CLO 4	Understand fundame	ental elemental cycles at Ear	th's surface		
	CLO 5	Apply methods and p	proxies for Earth surface pro	cess studies		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	EASC2401 and EASC2	2402 OR Pass in ENVS2001			
Offer in 2020 - 2021	Y 2n	d sem Offer in 2021	- 2022 : Y	Examination	May	
Grade Descriptors (A+ to F)	B C	evidence of original tho Demonstrate highly effec Demonstrate substantial situations. Show evide presentational skills Demonstrate general bi situations. Show evider	ought, and ability to apply knowled ctive organizational and presentation I command of the course material ince of analytical, critical though ut incomplete command of the co	thow strong ability for analytical, critical and gge to a wide range of complex, familiar and nal skills. and an ability to apply knowledge to familiar to some complex issues. Apply effective curse material and an ability to apply knowly thinking abilities. Apply moderately effective.	d unfamiliar situations. r and some unfamiliar e organizational and edge to most familiar	
	presentational skills. Demonstrate partial but limited command of the course material and a limited ability to apply knowledge to solve problems. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply limited or barely effective					
	Fail		evidence of command of course	material with very little or no ability to app ninking. Organization and presentational skills		
Course Type	Lecture v	vith laboratory compor	nent course			
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures		12 lectures @2 hours ea	ach	24	
	Laborato				18	
	Field wo				16	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignm	ents		40	CLO 1,2,3,4,5	
	Examina	ition		30	CLO 1,2,3,4	
	Project re	eport		30	CLO 1,2,3,4,5	
Required/recommended reading and online materials				nd Geomorphology. Cambridge Univ al Processes and Geomorphology. R		

EASC3419	Earth System Science Field Studies (6 credits)	Academic Year	2020				
Offering Department	Earth Sciences	Quota	15				
Course Co-ordinator	Dr Jed O Kaplan, Earth Sciences (jkaplan@hku.hk)						
Teachers Involved	(Dr Jed O Kaplan,Earth Sciences)						
	(Dr Nicole S Khan,Earth Sciences)						
Course Objectives	In this field-based course, students will study the structure and dynam	ic processes of coastal	zones, mountai				
-	glaciers, deserts and loess landforms. Students will learn basic methods of field observation and survey so as to						
	find out the systematic links between the different components of the Earth system.						
Course Contents	Dynamic interactions between the atmospheric, oceanic, and terrestrial	parts of the coastal zon	es; structure an				
& Topics	dynamics of mountain glaciers; structure, mineral composition, and the role of wind in the formation of deserts and						
	loess landforms.						
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 describe interactions between the sea, atmosphere and terrestrial environments at the coastal zone						
	CLO 2 describe principal characteristics of mountain glaciers, deserts and loess						
	CLO 3 explain causes and dynamic processes of these environments						
	CLO 4 show knowledge and critical understanding of the systematic relationships between these environments						
	CLO 5 demonstrate capability in analyzing the sustainable development of the human-environment relationships						

Pre-requisites		Pass one of the following 2000-level courses:					
(and Co-requisites		102 or ENVS2001 or C					
and Impermissible combinations)	Or upon	r upon special arrangement with the course coordinator					
Offer in 2020 - 2021	N O	offer in 2021 - 2022 : Y	•	Examination			
Grade Descriptors (A+ to F)	A	strong analytical and of analyze the Earth sys	mastery at an advanced level of knowle critical abilities and logical thinking, with a tem structure. Can insightfully combine he different components of the Earth sys tation skills.	evidence of insights, and the ability to the field investigation and indoor and	apply the knowledge to alysis to understand the		
	В	evidence of analytical Can combine the field	antial grasp of a wide range of knowled and critical abilities and logical thinking, a investigation and indoor analysis to unde betence in integrating knowledge and preso	and apply the knowledge to analyze the rstand the difference between the natu	Earth system structure.		
	С	of some analytical and problems and the diffe	al but incomplete grasp of knowledge and I critical abilities and logical thinking, and erence in rates and processes between nowledge and presentational skills.	ability to apply the knowledge to ana	lyze some Earth System		
	D	· ·					
	Fail						
Course Type	Field car	mps	· · ·				
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Field work		Field trip (23 days x 8 hours		184 16		
	Reading	g / Self study		Preparation of final video (in groups)			
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignn	nents	Daily assessement	33	CLO 1,2,3		
	Report		Video project	34	CLO 1,2,3,4,5		
	Test		Oral examination	33	CLO 1,2,3,4		
Required/recommended		d reading to be annou					
reading and online materials	Practica	l seminar with a docui	,				
Additional Course Information	transect terrain, t encompa visible o	Figure 1. Starting on the eastern slope of the Rocky Mountains in the northwestern U.S.A., we will make a three-week ransect to the Pacific coast, covering more than 3500 km, and visiting a range of landscapes from glaciated alpine errain, to loess plateaus, to sand dunes and deserts, and to coastlines. The Pacific Northwest of the United States encompasses range of landforms, climates, geology, soils, and biomes that are both relatively easy to access and visible over short distances. Priority of enrollment will be given to Earth System Science major students.					

EASC3999	Directe	ed studies in earth sciences (6 credits)	Academic Year	2020			
Offering Department	Earth Sc	ciences	Quota				
Course Co-ordinator	Dr Y Li, I	Dr Y Li, Earth Sciences (yiliang@hku.hk)					
Teachers Involved		teachers in the Department,Earth Sciences)					
Course Objectives	To enha	ance the student's knowledge of a particular topic and the studen skills.	t's self-directed lear	ning and critical			
Course Contents & Topics	The topi	The student undertakes a self-managed study on a topic in earth sciences under the supervision of a staff member. The topic is preferably one not sufficiently covered in the regular curriculum. The directed study can be a critical review or a synthesis of published work on the subject, or a laboratory or field study that would enhance the student's understanding of the subject. The project may not require an element of originality.					
Course Learning		essful completion of this course, students should be able to:					
Outcomes	r	enhance the ability in self-learning, data-collection and analysis, research in earth sciences		ng independent			
		write scientific dissertation, and conduct oral presentation of the resea					
Pre-requisites (and Co-requisites and Impermissible combinations)	System S Cumulat This cou Earth Sy	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in the Geology or Earth System Science Majors; and Cumulative GPA of 2.5 or above. This course is not a capstone course and students cannot use this course to fulfill the capstone requirement of the Earth System Science and Geology Majors. The earliest that a student is allowed to take this course is their year 3 study.					
Offer in 2020 - 2021		ear long Offer in 2021 - 2022 : Y	Examination	No Exam			
Grade Descriptors (A+ to F)	A	Demonstrate thorough grasp of the subject. Show strong analytical and critical original thought. Insightful use and critical analysis / evaluation of information draw to quote/reference aptly. Critical use of data and results to draw insightful conclusion organizational and presentational skills. [Work of A+ should show considerable critis required in wider areas relevant to the topic.]	abilities and logical thinki vn from a full range of high ions and solve problems.	n quality sources and Apply highly effective			
	В	Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly. Correct use of data of results to draw appropriate conclusions to draw insightful conclusions and solve problems. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Use of relevant information from sources, showing ability to make comparisons between different interpretations and to quote/reference aptly. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited grasp, with retention of some relevant information, logical thinking, but with limited analytical and critical abilities. Demonstrate use through summary rather than analysis and comparison. Limited ability to use dat Apply limited or barely effective organizational and presentational skills.	and reference of several	sources, but mainly			
	Fail	Apply limited or barely effective organizational and presentational skills. Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Limited use of secondary sources and no critical comparison of them. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.					
		minimally effective of interfective.					

Course Teaching	Activities	Details	Details	
& Learning Activities	Reading / Self study	The student is expected to spend the project	The student is expected to spend at least 120 hours on the project	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Research report	Report and presentation	100	CLO 1,2

EASC4403	Biogeoc	hemical cycles (6	credits)	Academic Yea	ar 2020		
Offering Department	Earth Scie	ences	·	Quota			
Course Co-ordinator	Dr Y Li, Ea	arth Sciences (yiliang	@hku.hk)				
Teachers Involved	(Dr Y Li,Ea	(Dr Y Li,Earth Sciences)					
Course Objectives	This course presents how the basic geochemistries of the Earth system, from atmosphere to the geosphere and to hydrosphere, have been and are being affected by the origin, evolution and existence of life. Human activities in particular, from the rapid consumption of resources to the destruction of the rainforests and the expansion of cities are leading to rapid changes in the geochemistry of the Earth systems.						
Course Contents & Topics	1) Origin of elements, the Solar system and the Earth 2) Geobiology and biogeochemical cycles: their role in the Earth system 3) Terrestrial biogeochemical cycles 4) Aquatic biogeochemical cycles 5) Marine biogeochemical cycles 6) Phosphorous cycle 7) Sulfur cycle 8) Carbon cycle 9) Nitrogen cycle 10) Biogeochemical cycles and impacts from human activities						
Course Learning	On succes	ssful completion of this	s course, students should be able	to:			
Outcomes	CLO 1 de	scribe the major geoc	hemical cycles on Earth				
	CLO 2 illu	strate the interactions	between the geochemical cycles	and the main environments o	n Earth		
	bio	ogeochemical cycles	een changes to the Earth systems		ships of changes to		
	CLO 4 kn	ows why the anthropo	ogenic activities become a signific	ant part of globe change			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in EA	ASC3403 or EASC341	10 OF ENVS3313				
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 -	2022 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	A	learning outcomes. Show	astery at an advanced level of extensiv strong analytical and critical activities and	l logical thinking.	· ·		
	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcome. Show evidence of analytical and critical abilities and logical thinking.						
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Apply moderately effective organizational and presentational skills. Show interest in the taught topics, and to answer					
	D	most questions correctly. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. She limited ability to apply knowledge to solve problems. Show some interest in the taught topics. Able to answer more than half of question correctly.					
	Fail	Demonstrate little or no e of analytical and critical	vidence of command of knowledge and s abilities, logical and coherent thinking. positive attitude in learning; not able to a	kills required for attaining the course I Show very little or no ability to app	earning outcomes. Lack		
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	.	Details		No. of Hours		
& Learning Activities	Lectures				28		
	Tutorials				10		
	Field work	<			8		
	Group wo	rk	PBL group work		10		
	Project wo	ork	Writing course thesis		30		
	Reading /	Self study	_		54		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Essay			60	CLO 1,2,3,4		
	Examinat	ion		40	CLO 1,2,3,4		
Required/recommended reading and		chemistry: An Analysis	of Global Change, William H. Sc	hlesinger, Emily Bernhardt.			

EASC4406	Earth dynamics & global tectonics (6 credits)	Academic Year	2020
Offering Department	Earth Sciences	Quota	
Course Co-ordinator	Prof G Zhao, Earth Sciences (gzhao @hku.hk)		
Teachers Involved	(Prof G Zhao,Earth Sciences) (Prof L S Chan,Earth Sciences)		
Course Objectives	To review the concepts and processes that shape the configuration of the This course is intended to provide students with an understanding of the global outcome of these processes through an examination of direct an hypotheses, and critical thinking.	driving forces of Earth p	rocesses and th
Course Contents & Topics	- Plate tectonics; orogenesis; accretionary and collisional orogensis Mantle convection; hot spots and plumes; - Methods of investigation of large scale structures and processes; - Structure and physical properties of the planet;		

	- Archea formation - Paleopi - Superc	n cratons: greenston and evolution; wh roterozoic collision continents in Earth	e earliest felsic crust; Late Heavy Bomba ones and TTG gneisses; origin of komat ien did plate tectonics start on Earth? tectonics. history: the assembly, outgrowth and I	tites; role of mantle plume			
Course Learning		Rodinia and Pangea. On successful completion of this course, students should be able to:					
Outcomes		•	on of the Earth as a dynamic planet				
	CLO 3 a	CLO 2 understand how energy release within the Earth is translated into geological processes CLO 3 appreciate the importance of a knowledge of the history of investigation of global scale tectonic process CLO 4 distill of a wide range of data to differentiate competing geological theories CLO 5 produce concise written and oral summaries of literature research on specific topics in global dynamics					
Pre-requisites (and Co-requisites and Impermissible combinations)			C3404 or EASC3408 or EASC3409	oaron on opeoine topice in	giobal dynamics		
Offer in 2020 - 2021	Y 2n	nd sem Offer in 20	021 - 2022 : Y	Examination	May		
Grade Descriptors	Α		show a thorough mastery of the knowledge and ski		-		
(A+ to F)		in-depth grasp of the subject, and provide evidence of strong analytical and logical thinking, where possible with original thought. Show outstanding and effective organizational and presentation skills, and the insightful use of data, literature reviews and other sources to undertake a high level of critical analysis and draw appropriate conclusions. Be able to integrate the full range of appropriate theories, principles, and evidence.					
(A+ to F)			ke a high level of critical analysis and draw appro				
(A+ to F)	В	appropriate theories The student should course outcomes, a organizational and p	ke a high level of critical analysis and draw appro	priate conclusions. Be able to in e of the skills necessary for attain vidence of the ability to think crition int information from different source	ntegrate the full range of ning most, if not all, of the cally and to have effective ces, showing the ability		
(A+ to F)	В	appropriate theories The student should course outcomes, a organizational and p make comparisons evidence. The student should course outcomes, a effective organizatio appropriate conclus	ke a high level of critical analysis and draw appro- to, principles, and evidence. The principles, and evidence and the subject. Show evidence a substantial knowledge of a significant rang nd have a substantial grasp of the subject. Show evidence that in the presentational skills and make critical use of relevant between consequent interpretations. Be capable have a general command of the knowledge, compand a general grasp of the subject. Show some evidenal and presentational skills. The student shoult information is should be able to use relevant information.	priate conclusions. Be able to in e of the skills necessary for attain vidence of the ability to think critic nt information from different source e of the general integration of etencies and skills required for at dence of critical ability and logica ld be moderately effective in the from sources and able to make	ning most, if not all, of the cally and to have effectives, showing the ability theories, principles and ttaining the majority of the use of data to draw the use of data to draw the context of the cont		
(A+ to F)		appropriate theories The student should course outcomes, a organizational and p make comparisons evidence. The student should course outcomes, a effective organizatio appropriate conclus different interpretatio The student should number of the cours critical thinking and results to draw app	ke a high level of critical analysis and draw appro- to, principles, and evidence. show a substantial knowledge of a significant rang nd have a substantial grasp of the subject. Show e presentational skills and make critical use of relevai between consequent interpretations. Be capable have a general command of the knowledge, comp- nd a general grasp of the subject. Show some evic principle and presentational skills. The student shou- sions, should be able to use relevant information nors, through partial integration of theories, principle have a partial but limited command of the know se learning outcomes, and a limited grasp of the su at least marginally effective organizational and propriate conclusions and use and reference a ve-	priate conclusions. Be able to in e of the skills necessary for attain vidence of the ability to think critic nt information from different source e of the general integration of etencies and skills required for at dence of critical ability and logical ld be moderately effective in the from sources and able to make as and evidence. ledge, competencies and skills in biject. Show evidence of some and presentational skills. Have limited	nintegrate the full range of the property of the collection of the		
(A+ to F)	С	appropriate theories The student should course outcomes, a organizational and p make comparisons evidence. The student should course outcomes, a effective organizati appropriate conclus different interpretatic The student should number of the cours critical thinking and results to draw app analysis and compa The student shows outcomes, lacks an little ability to a appl	ke a high level of critical analysis and draw appro- to, principles, and evidence. show a substantial knowledge of a significant rang nd have a substantial grasp of the subject. Show e presentational skills and make critical use of relevai between consequent interpretations. Be capable have a general command of the knowledge, comp- nd a general grasp of the subject. Show some evic principle and presentational skills. The student shou- sions, should be able to use relevant information nors, through partial integration of theories, principle have a partial but limited command of the know se learning outcomes, and a limited grasp of the su at least marginally effective organizational and propriate conclusions and use and reference a ve-	priate conclusions. Be able to in e of the skills necessary for attain vidence of the ability to think critical tinformation from different source of the general integration of eatencies and skills required for attencies and skills required for attencies of critical ability and logical do be moderately effective in the from sources and able to make so and evidence. In the same devidence of some an oresentational skills. Have limited triety of sources mainly in summanuired for attaining even the minuspectical and critical absence of analytical and critical	ning most, if not all, of the cally and to have effectives, showing the ability theories, principles and theories, principles and the call		
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Course Type Course Teaching	C D Fail Lecture-t Activitie	appropriate theories The student should course outcomes, a organizational and p make comparisons evidence. The student should course outcomes, a effective organizatio appropriate conclus different interpretation The student should number of the cours critical thinking and results to draw app analysis and compa The student shows outcomes, lacks an little ability to a appl little evidence of the based course	ke a high level of critical analysis and draw appro- in, principles, and evidence. show a substantial knowledge of a significant rang nd have a substantial grasp of the subject. Show e- presentational skills and make critical use of relevant between consequent interpretations. Be capable have a general command of the knowledge, compind a general grasp of the subject. Show some evicent and presentational skills. The student should be able to use relevant information ons, through partial integration of theories, principle have a partial but limited command of the knowledge and stills re- start least marginally effective organizational and propriate conclusions and use and reference a verision. little or no evidence of knowledge and skills re- overall grasp of the subject area and shows an ally knowledge to solve problems and has poor and is	priate conclusions. Be able to in e of the skills necessary for attain vidence of the ability to think critical tinformation from different source of the general integration of eatencies and skills required for attencies and skills required for attencies of critical ability and logical do be moderately effective in the from sources and able to make so and evidence. In the same devidence of some an oresentational skills. Have limited triety of sources mainly in summanuired for attaining even the minuspectical and critical absence of analytical and critical	ntegrate the full range of ning most, if not all, of the cally and to have effectives, showing the ability in theories, principles and taining the majority of the lithinking and moderate he use of data to draw the comparisons between eccessary for attaining nalytical competence and ability to use data an mary rather than through nority of course learning thinking abilities. Show ganizational skills. Show		
Course Type Course Teaching	C D Fail Lecture-t Activitie Lectures	appropriate theories The student should course outcomes, a organizational and p make comparisons evidence. The student should course outcomes, a effective organizatio appropriate conclus different interpretation. The student should number of the cours critical thinking and results to draw app analysis and compa The student shows outcomes, lacks an little ability to a appl little evidence of the coased course	ke a high level of critical analysis and draw appropers, principles, and evidence. In principles, and evidence. In principles, and evidence of a significant ranger of the subject. Show eversentational skills and make critical use of relevations between consequent interpretations. Be capable have a general command of the knowledge, compand a general grasp of the subject. Show some evidence of the subject of	priate conclusions. Be able to in e of the skills necessary for attain vidence of the ability to think critical tinformation from different source of the general integration of eatencies and skills required for attencies and skills required for attencies of critical ability and logical do be moderately effective in the from sources and able to make so and evidence. In the same devidence of some an oresentational skills. Have limited triety of sources mainly in summanuired for attaining even the minuspectical and critical absence of analytical and critical	ning most, if not all, of the cally and to have effectives, showing the ability in theories, principles and taining the majority of the lithinking and moderate he use of data to drake comparisons between eccessary for attaining nalytical competence and ability to use data an anary rather than through nority of course learning thinking abilities. Show ganizational skills. Show		
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Course Type Course Teaching & Learning Activities Assessment Methods	C D Fail Lecture-l Activitie Lectures Tutorials	appropriate theories The student should course outcomes, a organizational and p make comparisons evidence. The student should course outcomes, a effective organizatio appropriate conclus different interpretation The student should number of the cours critical thinking and results to draw app analysis and compa The student shows outcomes, lacks an little ability to a appl little evidence of the coased course 25 3 3 5 5 6 6 6 7 Self study	ke a high level of critical analysis and draw appropriate to the subject of a significant range of the subject show a substantial knowledge of a significant range of the subject. Show expresentational skills and make critical use of relevant between consequent interpretations. Be capable have a general command of the knowledge, compand a general grasp of the subject. Show some evitorial skills. The student should be able to use relevant information ons, through partial integration of theories, principle have a partial but limited command of the knowle learning outcomes, and a limited grasp of the suat least marginally effective organizational and propriate conclusions and use and reference a version. Iittle or no evidence of knowledge and skills recoverall grasp of the subject area and shows an all y knowledge to solve problems and has poor and integration of theories, principles and evidence. Details student seminars and exercises	priate conclusions. Be able to in the of the skills necessary for attain vidence of the ability to think critical tinformation from different source of the general integration of etencies and skills required for at dence of critical ability and logical did be moderately effective in tifform sources and able to make and evidence. It is not sources and skills in the contract of some and the contract of sources mainly in summarized for attaining even the minus process of analytical and critical in effective presentation and/or or sources mainly in summarized for attaining even the minus process of analytical and critical interfective presentation and/or or sources.	ntegrate the full range of hing most, if not all, of the cally and to have effectives, showing the ability theories, principles and ttaining the majority of the tight and moderate the use of data to draw the comparisons between the comparisons be		
Course Type Course Teaching & Learning Activities Assessment Methods	C D Fail Lecture-l Activitie Lectures Tutorials Reading	appropriate theories The student should course outcomes, a organizational and p make comparisons evidence. The student should course outcomes, a effective organizati appropriate conclus different interpretatic The student should number of the cours critical thinking and results to draw app analysis and compa The student shows outcomes, lacks an little ability to a appl little evidence of the coased course es S J / Self study	ke a high level of critical analysis and draw approsity, principles, and evidence. In principles, and evidence. In principles, and evidence of a significant ranger of the subject. Show eversentational skills and make critical use of relevant between consequent interpretations. Be capable have a general command of the knowledge, compand a general grasp of the subject. Show some evictional and presentational skills. The student should be able to use relevant information ons, through partial integration of theories, principle have a partial but limited command of the knowle learning outcomes, and a limited grasp of the suat least marginally effective organizational and propriate conclusions and use and reference a version. Ititle or no evidence of knowledge and skills recoverall grasp of the subject area and shows an all y knowledge to solve problems and has poor and integration of theories, principles and evidence. Details student seminars and exercises essay, presentation plus addition	priate conclusions. Be able to in e of the skills necessary for attain vidence of the ability to think critical information from different source of the general integration of eatencies and skills required for at dence of critical ability and logical do be moderately effective in the form sources and able to make some devidence. In the sources and able to make some devidence. Show evidence of some allores maked to some allores of sources mainly in summarized for attaining even the minuspector of analytical and critical neffective presentation and/or organized maked to the sources of analytical and critical neffective presentation and/or organized maked to the sources of analytical and critical neffective presentation and/or organized maked to the sources of analytical and critical neffective presentation and/or organized maked to the sources of analytical and critical neffective presentation and/or organized maked to the sources of analytical and critical neffective presentation and/or organized maked to the sources of analytical and critical neffective presentation and/or organized maked to the sources of the sou	ntegrate the full range ning most, if not all, of the cally and to have effectives, showing the ability theories, principles and ttaining the majority of the use of data to drawe comparisons between the use of data to drawe comparisons between the use of data to drawe comparisons between the use of data to drawe comparisons between the use of data to drawe comparisons between the use of data to drawe comparisons between the use of data to drawe comparisons between the use of data to draw the use of data to draw the use of data to draw the use of data to draw the use of the use		
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EASC4407	Regional geology (6 credits)	Academic Year	2020			
Offering Department	Earth Sciences	Quota	40			
Course Co-ordinator	Dr A A G Webb, Earth Sciences (aagwebb@hku.hk)					
Teachers Involved	(Dr A A G Webb,Earth Sciences) (Dr J R Ali,Earth Sciences)					
Course Objectives	This course explores regional geologies as well as the approaches that geologists use to resolve regional geological questions.					
Course Contents & Topics	We will use case studies to explore how regional investigations integrating to can test models for the evolution of large-scale geological systems. Like various climate-tectonic interactions across mountain belts (Andes, Himala of East Asia, and the progressive development of metamorphic core com America, NE China). Students will advance their abilities to synthesize and creating new Wikipedia pages complete with original figures on regional geo	ely case studies includ ya), the complex intra nplexes via low-angle I communicate geologi	de exploration of plate deformation normal faults (N. cal knowledge by			
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 appreciate the influential (and commonly conflicting) models that ha regional tectonic phenomena CLO 2 understand the various "tools" that are commonly used by geo-sc the evolution of tectonically complicated regions CLO 3 carry out an in-depth scientific literature review on a key regional findings via visual and written communication in an engaging, comp	ientists to test and de	velop models for			
Pre-requisites	Pass in EASC3402; and (EASC3403 or EASC3404)					

(and Co-requisites and Impermissible combinations)						
Offer in 2020 - 2021	Y 1:	st sem Offer in 2021	- 2022 : Y	Examination	No Exam	
Grade Descriptors (A+ to F)	Α	Thorough grasp of the subject; evidence of strong critical abilities and logical thinking; highly effective organizational and presentational skills; insightful use and critical analysis / evaluation of information drawn from a full range of high quality sources and to quote/reference antiv.				
	В	skills; critical use of re		s and logical thinking; effective organiza owing ability to make meaningful compa		
	С	organizational and pres		some critical abilities and logical thinki mation from sources, showing ability to ma		
	D					
	Fail			subject; little or no evidence of critical abili ills; limited use of secondary sources and		
Course Type	Lecture	with laboratory compo	nent course			
Course Teaching	Activities		Details	Details		
& Learning Activities	Lecture	S			28	
	Laborat	ory	guided literature surveys & wikipedia training		20	
	Reading	g / Self study			80	
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignr	ments	assignments	70	CLO 1,2,3	
	Test		2 tests	30	CLO 1,2	

EASC4408	Special t	topics in earth sciences (6 credits) Acade	emic Year	2020			
Offering Department	Earth Scie	nces Quota	а	30			
Course Co-ordinator	Dr M H Le	e, Earth Sciences (mhlee @hku.hk)					
eachers Involved		· · · · · · · · · · · · · · · · · · ·					
Course Objectives	Topic: Planetary system and Biogeochemistry The overall aim of this special topic is to develop an advanced understanding of our planet's place within the wide universe, the origins of our planetary system, and geological processes in extreme extraterrestrial environments Students will explore the concept of abiotic chemical evolution and learn about various important biomarker targeted for life detection in modern space exploration missions. The course also provides opportunities to student meteorites and their relationship to the origin of the Earth, solar system & universe, and survey planetary topics including impacts, differentiation, and volcanism on planetary objects.						
Course Contents & Topics	Including impacts, differentiation, and volcanism on planetary objects. The course will cover the following aspects of planetary science. The following topics will be covered in lectures 1. The interstellar medium 2. Star formation and the accretion of planets 3. Meteorites and comets 4. Impacts and craters 5. Evolution of other terrestrial planets 6. Prebiotic chemistry and the origins of life 7. Biosynthetic isotopic fractionations 8. Biomarker and molecular signatures 9. Symmetry-breaking mechanisms 10. Mass spectrometry for organic geochemists 11. Planetary mission concepts 12. Life detection on habitable planet and moons						
Course Learning	On succes	ssful completion of this course, students should be able to:					
	CLO 1 identify various planetary materials in the Solar System and understand how they formed and evolve CLO 2 understand how planetary events shaped the history of the Earth and the structure of our solar system recognise and differentiate between the organic signatures of biotic and abiotic materials, and appropriate use of particular chemical structures as molecular fossils to interpret past life based on understant of extant life. CLO 4 evaluate contemporary theories on the origin of life and the formation of complex organic molecular space and their delivery to planetary surfaces. CLO 5 use modern analytical techniques to reconstruct organic constituents in samples and interpret generated from the latest planetary missions						
Ore requisites		rture their interests and curiosity in the field of planetary science					
Pre-requisites (and Co-requisites and Impermissible combinations)		ny EASC3XXX or EASC4XXX course					
Offer in 2020 - 2021	N Offe		nination				
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes, and evidence of productive reading supplementing lectures. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to synthesize and apply knowledge to a wide range of complex, familiar and unfamiliar situations. Demonstrate critical use of data, literature reviews, and other sources to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to synthesize and apply knowledge to familiar and some unfamiliar situations, but falling short on excellence in some of these aspects. Demonstrate correct use of data, literature reviews, and other sources to draw appropriate conclusions. Apply effective organizational and presentational skills.						
	С	Demonstrate general but incomplete command of knowledge and skills required for attai outcomes. Show evidence of some analytical and critical abilities and logical thinking, an knowledge to most familiar situations. Demonstrate mostly correct but some erroneous use o sources to draw appropriate conclusions. Apply moderately effective organizational and preserved.	nd ability to sy of data, literatur	ynthesize and appl re reviews, and oth			
			e of the course				

				monstrate limited ability to use of data, liter barely effective organizational and presentation			
	Fail	of analytical and critical ab solve problems. Demons	evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack abilities, logical and coherent thinking. Show very little or no ability to synthesize and apply knowledge to onstrate misuse of data, literature reviews, and other sources and/or unable to draw appropriate on and presentational skills are minimally effective or ineffective.				
Course Type	Lecture wi	th laboratory compone	nt course				
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures		12 sessions x 2 hours		24		
	Laborator	y	6 sessions x 2 hours		12		
	Group wo	rk	preparation + presenta	tion	15		
	Tutorials		6 sessions x 2 hours		12		
	Reading / Self study				60		
	Assessment				15		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	nts		30	CLO 1,2,3,4,5,6		
	Presentat	ion	group presentation	20	CLO 1,2,3,4,6		
	Project re	port	individual essay	50	CLO 1,2,3,4,6		
Required/recommended reading and online materials	Introduction Introduction How to build In Quest of Enrichment	leteorites and their parent planets, McSween, 1999. ISBN: 9780521587518 utroduction to Astrobiology. Gilmour and Sephton, 2004. ISBN 9780521837361 utroduction to Organic Geochemistry. Killops and Killops, 2013. ISBN: 9780632065042 ow to build a habitable planet, Langmuir and Broeker, 2012. ISBN: 9780691140063 Quest of the Universe, Koupelis, 2012. ISBN: 9781449647940					

	Earth s	system: contempo	rary issues (6 credits)	Academic Yea	r 2020			
Offering Department	Earth Sc	ciences		Quota				
Course Co-ordinator	Dr S C C	Dr S C Chang, Earth Sciences (suchin@hku.hk)						
Teachers Involved	(Dr S C	(Dr S C Chang, Earth Sciences)						
Course Objectives	This is a capstone course that provides students with an opportunity to synthesize and correlate the knowledge gained in previous courses in Earth System Science for them to gain a more in-depth appreciation and awareness of the Earth System, the interplay between its component parts, and some of the global issues. Students will also get some basic concepts on how to do strategic analysis on global trends of natural resources.							
Course Contents & Topics	Introduct Overpop Overpop Global T Global T	Introductions to Contemporary Environmental Issues Overpopulation & Natural Resources Overpopulation & Waste Management Global Trend in Green Technology Global Trend in Space Exploration Contemporary Environmental Issues & Solutions						
Course Learning	On succ	essful completion of th	nis course, students should be able	to:				
Outcomes	CLO 1	comprehend in some of	depth the nature of the issues confr	onting humankind as part of the	e Earth System			
	CLO 2 i	understand the basis of	of interrelationships through feedba	ck loops within the Earth System	m			
			data available from a variety of so contemporary concern	ources and apply the data to	problem solving			
	CLO 4 I	understand how past a	and present activities on the planet	will affect its future				
Pre-requisites	Pass in	at least 24 credits of	advanced level (level 3 or 4) discip	plinary core/elective courses in	the Earth Syste			
and Co-requisites	Science	Major including at least	st two of the following courses: EAS	SC3410, EASC3415 or ENVS3	313.			
and Impermissible			arth System Science Major students					
combinations)	The earl	iest that a student is a	Illowed to take this capstone course	e is their year 3 study.				
Offer in 2020 - 2021	Y 2r	nd sem Offer in 2021	1 - 2022 : Y	Examination	No Exam			
Grade Descriptors (A+ to F)	A	learning outcomes. Sho to synthesize and appl	mastery at an advanced level of extensive ow strong analytical and critical abilities and ly knowledge to a wide range of complex, t , and other sources to draw appropriate an	l logical thinking, with evidence of origi familiar and unfamiliar situations. Dem	inal thought, and abili nonstrate critical use			
	В	Demonstrate substantia learning outcomes. Sh knowledge to familiar a draw appropriate conclu	al command of a broad range of knowledge low evidence of analytical and critical abilit and some unfamiliar situations. Demonstrate usions. Apply effective organizational and pr	ties and logical thinking, and ability to e correct use of data, literature reviews resentational skills.	s synthesize and app s, and other sources			
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Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	C D Fail Project-L Activitic Meeting Reading	Demonstrate substantial learning outcomes. Sh knowledge to familiar a draw appropriate concluders. Show evide showledge to most fam sources to draw appropriate partial but show evidence of som synthesize and apply a sources to draw appropriate to draw appropriate to draw appropriate to draw appropriate to draw appropriate to draw appropriate in the original solve problems. Demonstrate little or no of analytical and critical solve problems. Democonclusions. Organizationased course with supervisor of a feet of the draw appropriate to the draw appropriat	al command of a broad range of knowledge ow evidence of analytical and critical abilit and some unfamiliar situations. Demonstrate usions. Apply effective organizational and probut incomplete command of knowledge arence of some analytical and critical abilitie niliar situations. Demonstrate mostly correct briate conclusions. Apply moderately effectivit limited command of knowledge and skills ne coherent and logical thinking, but with I knowledge to solve problems. Demonstrate briate conclusions. Apply limited or barely effort or evidence of command of knowledge and si I abilities, logical and coherent thinking. Sho onstrate misuse of data, literature review ion and presentational skills are minimally efforts.	ties and logical thinking, and ability to e correct use of data, literature review: resentational skills. In skills required for attaining most of es and logical thinking, and ability to but some erroneous use of data, litera e organizational and presentational ski required for attaining some of the cou imited analytical and critical abilities. I limited ability to use of data, literature fective organizational and presentational kills required for attaining the course le w very little or no ability to synthesize a s, and other sources and/or unable	o synthesize and apps, and other sources of the course learning synthesize and app ture reviews, and oth lls. rse learning outcome Show limited ability ure reviews, and oth al skills. earning outcomes. La and apply knowledge to draw appropriate to draw appropriate to the skills.			

	Oral presentation		50	CLO 1,2,3,4			
	Research report		20	CLO 1,2,3,4			
Required/recommended reading and online materials	Earth system science: from biogeochemical cycles to global change / edited by Michael C. Jacobson et al., San Diego, California: Academic Press, c2000.						
	The earth system. Lee R. Kump, James F. Kasting, Robert G. Crane. Upper Saddle River, N.J.: Pearson Pred Hall, c2004.						
	Living in the environment / G. Tyler Belmont, CA: Brooks/Cole, c2012.						

EASC4955	Integrate	ed field studies (6	credits)	Academic Yea	r 2020	
Offering Department	Earth Scie	nces		Quota	35	
Course Co-ordinator	Dr J A Kin	g, Earth Sciences (jes	ssking@hku.hk)			
Teachers Involved		ng,Earth Sciences) cKenzie,Earth Scienc	es)			
Course Objectives			amp activities are to provide:			
204.00 02,004.700			ence in geological mapping techniques			
			dence in independently applying these		al and stratigraph	
	complexity	, ,	asines in interprinating applying another		and onangrapin	
			hand areas of particular geological inte	erest and importance of an	overseas locality	
	/	•	of geological knowledge from multiple	•	,	
Course Contents			ological interest and will undertake inc		ping and probler	
& Topics	solving ex	ercises in each area.	The curriculum comprised 3 x 6-day	long projects (based on a	n ∼2x5km area o	
	interest),w	here each week long	project is typically scheduled as follow	s:		
	Day 1-2: Ir	nstructor-lead learninເ	g.			
			independent field mapping and site vis	sit.		
		ld examination.				
	Day 7: Wr	ite up/Rest.				
			is required to produce:			
			area. (15% x 3 = 45%)			
		ection of the area. (5%	,	(450/) This field	_ - 4 -	
			e students must prepare ONE report			
			nthesized from the all three projects are	id site visits, complete with	n interpretations	
		iai environments, mag i field skills:	matic events and structural data.			
			students, working INDEPENDENTLY	of other students and fa	culty construct	
			is in a small (~1km x ~1km) area that t			
	one-day fi	•	is in a sinali (* ikin x * ikin) alea tilat t	ney have not previously vi	siled. (3 % ioi eat	
	,	e awarded for profess	sional conduct			
ourse Learning		•	s course, students should be able to:			
Outcomes		•		role		
Jutcomes	CLO 1 Describe the petrography and petrogenesis of rocks and minerals. CLO 2 Identify geological setting from lithologies and stratigraphy.					
			nalyse structural data.			
			•			
	CLO 4 Construct geological maps and cross-sections.					
	CLO 5 Synthesize varied geological information pertaining to an area in order to derive a basic model of tectonic evolution.					
			valuate areas of notantial natural hazar	d/acanomia natantial		
			valuate areas of potential natural hazar		OI M-:	
Pre-requisites			Ivanced level (level 3 or 4) disciplinary	core/elective courses in tr	ie Geology Major	
and Co-requisites and Impermissible	Geology Major (Intensive). This must include either a PASS in, or student must be already enrolled in EASC3403, EASC3404 and EASC3409.					
combinations)	This must include either a PASS in, or student must be already enrolled in EASC3403, EASC3404 and EASC3409. This capstone course is for Geology Major/ Geology Major (Intensive) students only.					
combinations)	This capstone course is for Geology Major/ Geology Major (intensive) students only. The earliest that a student is allowed to take this capstone course is their year 3 study.					
Offer in 2020 - 2021		sem Offer in 2021		Examination	No Exam	
Grade Descriptors	Α		rasp of the subject. Show strong analytical and			
(A+ to F)			ighly fieldwork skills and techniques. Critical us		propriate and insightfu	
	conclusions. Apply highly effective organizational and presentational skills. Demonstrate substantial grass of the subject. Evidence of analytical and critical abilities and logical thinking. Apply effective					
	B Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Apply effective fieldwork skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and					
	presentational skills.					
	Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Apply moderately affective fieldwork skills and techniques. Mostly correct but some erroneous use of data and results to draw					
	Apply moderately effective fieldwork skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	D					
			limited analytical and critical abilities. Apply pa			
		skills.	sults to draw appropriate conclusions. Apply limi	ited or barely effective organization	onal and presentation	
	Fail		of little or no grasp of the knowledge and und	erstanding of the subject. Evide	nce of little or lack of	
	- 4	analytical and critical a	bilities, logical and coherent thinking. Apply	minimally effective or ineffective	e fieldwork skills and	
			ta and results and/or unable to draw appropriate	e conclusions. Organization and p	oresentational skills a	
Course Tune	Field	minimally effective or ine	necuve.			
Course Type Course Teaching	Field camp		Deteile	T	Na afile	
	Activities	i	Details		No. of Hours	
Learning Activities	Lectures		18 sessions x 1 hour		18	
	Field work		18 field days x 5 hours/day		90	
		Self study			72	
Assessment Methods	Methods		Details	Weighting in final	Assessment	
and Weighting				course grade (%)	Methods	
					to CLO Mapping	
	Assignme	ents	Area Maps & Cross-sections (3 x	60	CLO 1,2,3,4	
	, 100.g		20% each		020 .,2,0, .	

		professional conduct		
	Test	3 Field Test (5% each)	15	CLO 1,2,3,4
Additional Course Information	courses underway during the ser	ight to withdraw any students with mester (semester 2) prior to leavi xamination result or laboratory perf	ing for field camp (May/J	

EASC4966	Earth scie	nces internship (6	credits)	Academic Year	2020		
Offering Department	Earth Science	ces		Quota			
Course Co-ordinator	Dr M C Chei	Dr M C Cheung, Earth Sciences (hmcc@hku.hk)					
Teachers Involved	(Dr M C Cheung, Earth Sciences)						
Course Objectives	This course aims to offer students the opportunities to gain work experience in the industry related to their major o study. The workplace learning experience would be of great benefits to the students to apply their knowledge gained in the study to the real work environments. Students have to take on at least 160 hours of internship work either within the University or outside the University arranged by the School/Departments.						
Course Contents & Topics	(1) Within the university: The student will be supervised by a staff member (Supervisor), working on a project or various tasks as instructed by the Supervisor. (2) Outside the university: The student will work in an external agency related to the major of study. The student will be supervised under a staff member of the external agency (the External Supervisor) and a staff member of the Department/School of the student (the Internal Supervisor). The work to be performed by the student will normally be instructed by the External Supervisor, with prior agreement of the Internal Supervisor.						
Course Learning	On successf	ful completion of this c	ourse, students should be able to:				
Outcomes	CLO 1 gai	n at least 4 weeks of v	vork experience in a geosciences-re	elated firm or the Governme	ent		
	CLO 2 acc	quire an understanding	g and appreciation of the real work	environment			
	CLO 3 hav	e some experience w	ith applying learned knowledge to s	solving real world problems			
Pre-requisites (and Co-requisites and Impermissible combinations)	System Scie This course Earth Syster	ence Majors. is not a capstone cou n Science and Geolog	nced level (level 3 or 4) disciplinary rse and students cannot use this copy Majors. ed to take this course is their year 3	ourse to fulfill the capstone	0,		
Offer in 2020 - 2021			ner Offer in 2021 - 2022 : Y	Examination	No Exam		
Grade Descriptors (Pass /Pass with distinction /Fail)	Distincti on	performance in handling effective collaboration an	ability in applying knowledge to solve and carrying out the work required in thid communication with supervisor(s), colle e Course Description regarding working how by supervisor(s), etc.	e job or assigned by supervisor(agues, and clients in the job. S	s). Establishes highly uccessfully fulfills the		
	Pass						
	Fail	assigned by supervisor(s)	to solve problems in the workplace. Fails). Fails to establish effective collaboration o satisfy the requirements set out in the Cour pervisor(s), etc.	r communication with supervisor(s), other colleagues, or		
Course Type	Internship						
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Internship w	ork (it is expected that students are to work at least 160 hours (or the equivalent of 4 weeks full-time)		160		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Written repo	ort	written report, employer's feedback and oral presentation	100	CLO 1,2,3		
Additional Course Information	contact the I Enrolment o	Department to obtain to find the course is not course is not course is not course is not course.	"Pass/Fail" basis. Students who a he approval. Inducted via the online course select after approval has been obtained for	ction system and should be	made through the		

EASC4999	Earth sciences project (12 credits)	Academic Year	2020
Offering Department	Earth Sciences	Quota	
Course Co-ordinator	Dr Y Li, Earth Sciences (yiliang @hku.hk)		
Teachers Involved	(Various teachers in the Department, Earth Sciences)		
Course Objectives	To enhance the student's knowledge, ability and interest in advanced stud the student with an opportunity to be engaged in an advanced research project.		ices by providing
Course Contents & Topics	The student undertakes a research project in the form of a senior thesis un The project could be based on a particular component of a staff member's roby the student. The student must involve in the project in a non-trivial mann formulation, data collection and analysis, and presentation. The project should	esearch or one propos ner, and play a major i	sed and designed role in the project
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 acquire first-hand research experience in earth sciences by d independently under the supervision of a supervisor CLO 2 select research topics, design research path, choose research to critical thinking CLO 3 enhance the ability in doing independent earth/environmental research	echnology, and more	importantly use
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/e System Science Majors; and Cumulative GPA of 2.7 or above. This course is not a capstone course and students cannot use this course to Earth System Science and Geology Majors. The earliest that a student is allowed to take this course is their year 3 study	elective courses in the	Geology or Earth
Offer in 2020 - 2021	Y Year long Offer in 2021 - 2022 : Y	Examination	No Exam

Grade Descriptors (A+ to F)	A	Demonstrate thorough grasp of the subject. Show strong analytical and critical abilities and creative thinking, with evidence of original thought. Insightful use and critical analysis / evaluation of information drawn from a full range of high quality sources and to quotel/reference aptly. Critical use of first-hand data and results to draw insightful conclusions and solve problems. Apply highly effective organizational and presentational skills. [Work of A+ should show considerable creative thinking and additional work beyond that is required in wider areas relevant to the topic.]					
	В	Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and creative thinking. Critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly. Correct use of first-hand data of results to draw appropriate conclusions to draw insightful conclusions and solve problems. Apply effective organizational and presentational skills.					
	С	Use of relevant informatio quote/reference aptly. Most	complete grasp of the subject. Evidence of n from sources, showing ability to make ly correct but some erroneous use of first- organizational and presentational skills.	comparisons between different	t interpretations and to		
	D	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Demonstrate use and reference of several sources, but mainly through summary rather than analysis and comparison. Limited ability to use first-hand data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.					
	Fail	11.7					
Course Type	Project-	based course					
Course Teaching	Activit	ies	Details		No. of Hours		
& Learning Activities	Reading / Self study		The student is expected to spend at least 240 hours on the project		240		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Dissert	ation	Dissertation and presentation	100	CLO 1,2,3		

ENVS1401	Introdu	ction to environmenta	al science (6 credits)	Academic Year	2020		
Offering Department	Earth Sci	ences	11				
Course Co-ordinator	Dr C Not	C Not, Earth Sciences (cnot@hku.hk)					
Teachers Involved	(Dr C Dingle,School of Biological Sciences) (Dr C Not,Earth Sciences)						
Course Objectives	To provide students with an inter-disciplinary introduction to Environmental Science highlighting the interconnections between biological, geological, and chemical processes. To convey the basic science behind environmental interactions and place it within the context of human impact and dependence on the natural world. To better understand how humans interact, manage, and sustain the environment within the context of our economies, governments and individual choices.						
Course Contents & Topics	Part I: TI science problems Part II: U assuring Part III: (The teaching and learning will be organized around key issues, and loosely divided into three sections. Part I: The basics: application of science to solve environmental problems; key ecological, chemical, and earth science concepts essential to environmental science, understanding the underlying causes of environmental problems (human population growth and economics). Part II: Using and conserving our resources: how we use and misuse key natural resources; the difficulty in assuring a sustainable supply of energy; waste management and air pollution issues. Part III: Global issues: How do our actions change the face of the planet? Urban ecology and understanding our contribution to global climate change.					
ourse Learning	On succe	essful completion of this co	urse, students should be able t	0:			
Outcomes				d biological components of the	environment.		
		•	an activities on the environmer	0 1			
				ve examples of how society ca	n adant hehavi		
			Torrinerital sustainability and gr	ve examples of now society ea	in adapt benavi		
	to achieve sustainability.						
	CLO 4 Understand how we are overusing our resources and compare different approaches to resolving specific						
		roblems presented in class	5.				
Tro roquicitor	NIII						
and Co-requisites and Impermissible	NIL						
and Co-requisites nd Impermissible ombinations)		t sem Offer in 2021 - 202	:2 : Y	Examination	Dec		
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021		Demonstrate thorough under complex, familiar and unfamili	standing of the subject and an ability ar situations. Show evidence of logica	Examination	to a wide range		
Pre-requisites and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Y 1s	Demonstrate thorough under complex, familiar and unfamili on time and to a high academ Demonstrate a good understa	standing of the subject and an ability ar situations. Show evidence of logicatic ic standard. Inding of the subject and an ability to	/ to apply knowledge gained in class thinking and some original thought. C apply knowledge to familiar and some	s to a wide range coursework complet		
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 1s	Demonstrate thorough under complex, familiar and unfamilion time and to a high academ Demonstrate a good understate Show evidence of logical think Demonstrate general but inco Show some evidence of logical	standing of the subject and an ability ar situations. Show evidence of logica ic standard. In the subject and an ability to ining abilities. Coursework completed or implete understanding of the subject al thinking, but with some inconsistenci	y to apply knowledge gained in class thinking and some original thought. C	s to a wide range coursework complet unfamiliar situation d. ost familiar situation		
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 1s	Demonstrate thorough under complex, familiar and unfamilion time and to a high academ Demonstrate a good understa Show evidence of logical think Demonstrate general but inco Show some evidence of logica in an adequate academic stan Demonstrate partial but limite only able to apply knowledge	standing of the subject and an abilit ar situations. Show evidence of logica ic standard. inding of the subject and an ability to ing abilities. Coursework completed or implete understanding of the subject a al thinking, but with some inconsistenci dard. d grasp of the subject and a limited a	y to apply knowledge gained in class I thinking and some original thought. C apply knowledge to familiar and some I time and to a good academic standard an ability to apply knowledge to mo	s to a wide range coursework complet unfamiliar situation d. ost familiar situation submitted on time a niliar situations. Sho		
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 1s A B C	Demonstrate thorough under complex, familiar and unfamilion time and to a high academ Demonstrate a good understs Show evidence of logical think Demonstrate general but inco Show some evidence of logical in an adequate academic stan Demonstrate partial but limite only able to apply knowledge standard. Demonstrate little or no under	standing of the subject and an ability ar situations. Show evidence of logical ic standard. Indicate an ability to sing abilities. Coursework completed or mplete understanding of the subject all thinking, but with some inconsistencidard. It is a subject and a limited a to simple examples. Show little evide to simple examples. Show little evide	y to apply knowledge gained in class thinking and some original thought. C apply knowledge to familiar and some time and to a good academic standar nd an ability to apply knowledge to mes. Some coursework incomplete, but shility to apply knowledge to some famore of logical thinking. Coursework su or no ability to apply knowledge to fan	is to a wide range coursework complet unfamiliar situation d. ost familiar situation submitted on time a niliar situations. Sho bmitted late to a po		
and Co-requisites and Impermissible combinations) Iffer in 2020 - 2021 Irade Descriptors (A+ to F)	Y 1s A B C D	Demonstrate thorough under complex, familiar and unfamilion time and to a high academ Demonstrate a good understs Show evidence of logical think Demonstrate general but inco Show some evidence of logical in an adequate academic stan Demonstrate partial but limite only able to apply knowledge standard. Demonstrate little or no under	standing of the subject and an abilit ar situations. Show evidence of logical ic standard. Inding of the subject and an ability to ing abilities. Coursework completed or mplete understanding of the subject a al thinking, but with some inconsistenci dard. If grasp of the subject and a limited a to simple examples. Show little eviderstanding of the subject and very little	y to apply knowledge gained in class thinking and some original thought. C apply knowledge to familiar and some time and to a good academic standar nd an ability to apply knowledge to mes. Some coursework incomplete, but shility to apply knowledge to some famore of logical thinking. Coursework su or no ability to apply knowledge to fan	is to a wide range coursework complet unfamiliar situation d. ost familiar situation submitted on time a niliar situations. She bmitted late to a po		
and Co-requisites and Impermissible ombinations) Iffer in 2020 - 2021 Irade Descriptors (A+ to F)	Y 1s A B C D	Demonstrate thorough under complex, familiar and unfamilion time and to a high academ Demonstrate a good understs Show evidence of logical think Demonstrate general but inco Show some evidence of logical in an adequate academic stan Demonstrate partial but limite only able to apply knowledge standard. Demonstrate little or no under no evidence of logical or cohe passed course	standing of the subject and an abilit ar situations. Show evidence of logical ic standard. Inding of the subject and an ability to ing abilities. Coursework completed or mplete understanding of the subject a al thinking, but with some inconsistenci dard. If grasp of the subject and a limited a to simple examples. Show little eviderstanding of the subject and very little	y to apply knowledge gained in class thinking and some original thought. C apply knowledge to familiar and some time and to a good academic standar nd an ability to apply knowledge to mes. Some coursework incomplete, but shility to apply knowledge to some famore of logical thinking. Coursework su or no ability to apply knowledge to fan	is to a wide range coursework complet unfamiliar situation d. ost familiar situation submitted on time a niliar situations. She bmitted late to a po		
and Co-requisites and Impermissible combinations) Iffer in 2020 - 2021 Irade Descriptors (A+ to F)	Y 1s A B C D Fail Lecture-b	Demonstrate thorough under complex, familiar and unfamilion time and to a high academ Demonstrate a good understate Show evidence of logical think Demonstrate general but inco Show some evidence of logical in an adequate academic stan Demonstrate partial but limite only able to apply knowledge standard. Demonstrate little or no under no evidence of logical or cohe passed course	standing of the subject and an abilit ar situations. Show evidence of logical ic standard. unding of the subject and an ability to ing abilities. Coursework completed or mplete understanding of the subject a al thinking, but with some inconsistenci dard. d grasp of the subject and a limited a to simple examples. Show little evide extanding of the subject and very little rent thinking. Coursework missing or si	y to apply knowledge gained in class thinking and some original thought. C apply knowledge to familiar and some time and to a good academic standar nd an ability to apply knowledge to mes. Some coursework incomplete, but shility to apply knowledge to some famore of logical thinking. Coursework su or no ability to apply knowledge to fan	s to a wide range coursework complet unfamiliar situation d. ost familiar situation submitted on time a nilliar situations. She bmitted late to a point of the situations. She miliar situations. She miliar situations. She		
and Co-requisites and Impermissible combinations) Iffer in 2020 - 2021 Irade Descriptors (A+ to F)	Y 1s A B C D Fail Lecture-t Activitie Lectures	Demonstrate thorough under complex, familiar and unfamilion time and to a high academ Demonstrate a good understa Show evidence of logical think Demonstrate general but inco Show some evidence of logica in an adequate academic stan Demonstrate partial but limite only able to apply knowledge standard. Demonstrate little or no under no evidence of logical or cohe cased course	standing of the subject and an abilit ar situations. Show evidence of logica ic standard. unding of the subject and an ability to ing abilities. Coursework completed or mplete understanding of the subject a al thinking, but with some inconsistenci dard. d grasp of the subject and a limited to simple examples. Show little evide standing of the subject and very little rent thinking. Coursework missing or se	y to apply knowledge gained in class thinking and some original thought. C apply knowledge to familiar and some time and to a good academic standar nd an ability to apply knowledge to mes. Some coursework incomplete, but shility to apply knowledge to some famore of logical thinking. Coursework su or no ability to apply knowledge to fan	s to a wide range coursework complet unfamiliar situation d. ost familiar situation submitted on time a niliar situations. She bmitted late to a point of the situations. She will be situations and situations will be situation and situations will be situation and situations will be situation and situations will be situation and situation will be situation and situation and situation and situation will be situation and sit		
and Co-requisites nd Impermissible ombinations) Iffer in 2020 - 2021 Irade Descriptors (A+ to F)	Y 1s A B C D Fail Lecture-t Activitie Lectures Tutorials	Demonstrate thorough under complex, familiar and unfamili on time and to a high academ Demonstrate a good understat Show evidence of logical think Demonstrate general but inco Show some evidence of logics in an adequate academic stan Demonstrate partial but limite only able to apply knowledge standard. Demonstrate little or no under no evidence of logical or cohe passed course	standing of the subject and an ability ar situations. Show evidence of logical ic standard. Inding of the subject and an ability to sing abilities. Coursework completed or implete understanding of the subject at all thinking, but with some inconsistenci dard. It diple the subject and a limited at to simple examples. Show little evide restanding of the subject and very little rent thinking. Coursework missing or simple examples.	y to apply knowledge gained in class thinking and some original thought. C apply knowledge to familiar and some time and to a good academic standar nd an ability to apply knowledge to mes. Some coursework incomplete, but shility to apply knowledge to some famore of logical thinking. Coursework su or no ability to apply knowledge to fan	is to a wide range coursework complet unfamiliar situation d. ost familiar situation d. ost familiar situations. She initiar situations situations she initiar situations. She initiar situations she initiar situat		
and Co-requisites and Impermissible ombinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Y 1s A B C D Fail Lecture-t Activitie Lectures Tutorials Field wo	Demonstrate thorough under complex, familiar and unfamili on time and to a high academ Demonstrate a good understa Show evidence of logical think Demonstrate general but inco Show some evidence of logica in an adequate academic stan Demonstrate partial but limite only able to apply knowledge standard. Demonstrate little or no under no evidence of logical or cohe coased course	standing of the subject and an abilit ar situations. Show evidence of logical ic standard. unding of the subject and an ability to ing abilities. Coursework completed or mplete understanding of the subject a al thinking, but with some inconsistenci dard. d grasp of the subject and a limited to simple examples. Show little evide standing of the subject and very little rent thinking. Coursework missing or se	y to apply knowledge gained in class thinking and some original thought. C apply knowledge to familiar and some time and to a good academic standar nd an ability to apply knowledge to mes. Some coursework incomplete, but shility to apply knowledge to some famore of logical thinking. Coursework su or no ability to apply knowledge to fan	is to a wide range coursework complet unfamiliar situation d. ost familiar situation submitted on time a miliar situations. Shomitted late to a point of the course of the		
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching Learning Activities	Y 1s A B C D Fail Lecture-t Activitie Lectures Tutorials Field wo Reading	Demonstrate thorough under complex, familiar and unfamili on time and to a high academ Demonstrate a good understa Show evidence of logical think Demonstrate general but inco Show some evidence of logica in an adequate academic stan Demonstrate partial but limite only able to apply knowledge standard. Demonstrate little or no under no evidence of logical or cohe pased course	standing of the subject and an ability ar situations. Show evidence of logical ic standard. Inding of the subject and an ability to sing abilities. Coursework completed or implete understanding of the subject at alt thinking, but with some inconsistenci dard. It diple the subject and a limited a to simple examples. Show little evide restanding of the subject and very little rent thinking. Coursework missing or simple examples.	y to apply knowledge gained in class I thinking and some original thought. C apply knowledge to familiar and some time and to a good academic standard an ability to apply knowledge to mees. Some coursework incomplete, but subility to apply knowledge to some famice of logical thinking. Coursework su or no ability to apply knowledge to familiar to apply knowledge to some familiar to apply knowledge to familiar to apply knowledge to some familiar to apply knowledge to familiar to apply knowledge to familiar to apply knowledge to some familiar to apply knowledge to apply knowledge to some familiar to apply kno	is to a wide range coursework complet unfamiliar situation d. ost familiar situation submitted on time a miliar situations. Show the second of		
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching & Learning Activities	Y 1s A B C D Fail Lecture-t Activitie Lectures Tutorials Field wo	Demonstrate thorough under complex, familiar and unfamili on time and to a high academ Demonstrate a good understa Show evidence of logical think Demonstrate general but inco Show some evidence of logica in an adequate academic stan Demonstrate partial but limite only able to apply knowledge standard. Demonstrate little or no under no evidence of logical or cohe pased course	standing of the subject and an ability ar situations. Show evidence of logical ic standard. Inding of the subject and an ability to sing abilities. Coursework completed or implete understanding of the subject at all thinking, but with some inconsistenci dard. It diple the subject and a limited at to simple examples. Show little evide restanding of the subject and very little rent thinking. Coursework missing or simple examples.	y to apply knowledge gained in class thinking and some original thought. C apply knowledge to familiar and some time and to a good academic standard an ability to apply knowledge to mess. Some coursework incomplete, but subility to apply knowledge to some famice of logical thinking. Coursework sulor no ability to apply knowledge to familiar to apply knowledge to apply k	is to a wide range coursework complet unfamiliar situation d. ost familiar situation submitted on time a miliar situations. Shipmitted late to a point of the course of th		
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 1s A B C D Fail Lecture-t Activitie Lectures Tutorials Field wo Reading	Demonstrate thorough under complex, familiar and unfamili on time and to a high academ Demonstrate a good understs. Show evidence of logical think Demonstrate general but inco Show some evidence of logica in an adequate academic stan Demonstrate partial but limite only able to apply knowledge standard. Demonstrate little or no under no evidence of logical or cohe passed course.	standing of the subject and an ability ar situations. Show evidence of logical ic standard. Inding of the subject and an ability to sing abilities. Coursework completed or implete understanding of the subject at alt thinking, but with some inconsistenci dard. It diple the subject and a limited a to simple examples. Show little evide restanding of the subject and very little rent thinking. Coursework missing or simple examples.	y to apply knowledge gained in class thinking and some original thought. C apply knowledge to familiar and some time and to a good academic standard an ability to apply knowledge to mess. Some coursework incomplete, but subility to apply knowledge to some famice of logical thinking. Coursework sulor no ability to apply knowledge to familiar to apply knowledge to apply k	is to a wide range coursework complete unfamiliar situation d. ost familiar situation d. ost familiar situation submitted on time a niliar situations. Sho be mitted late to a point of the course of		

Test	4 quizzes	20	CLO 1,2,3,4
Miller: Living in the Environment (T Keller and Botkin: Essential Enviro			

ENVS2020	Biogeochemistry	of the environment (6 credits)	Academic Year	2020
Offering Department	Earth Sciences	,	Quota	
Course Co-ordinator	, ()		<u>'</u>	'
Teachers Involved				
Course Objectives				
Course Contents & Topics				
Course Learning Outcomes	On successful comp	letion of this course, students should be	able to:	
Pre-requisites (and Co-requisites and Impermissible combinations)				
Offer in 2020 - 2021	N Offer in 2021	- 2022 : N	Examination	
Grade Descriptors	Α		·	
(A+ to F)	В			
	С			
	D			
	Fail			
Course Type				
Course Teaching & Learning Activities	Activities	Details		No. of Hours
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping

ENVS3007	Natural	hazards and mitigat	tion (6 credits)	Academic Yea	r 2020		
Offering Department	Earth Scient						
Course Co-ordinator	Dr N S KI	Dr N S KHAN, Earth Sciences (nskhan@hku.hk)					
Teachers Involved	(Dr N S K	(Dr N S KHAN,Earth Sciences)					
	(TBC,Earth Sciences)						
Course Objectives	This course introduces students the mechanisms of major natural hazards including earthquake, storm and flood landslide and tsunami. The teaching emphasizes the fundamental concepts: natural hazards are not entirely natural, and understanding the frequency and processes of these hazards is essential in developing prevention protection and mitigation measures. With case studies, the course will help students explore the political economical and engineering means of dealing with natural hazards.						
Course Contents	Key chara	acteristics of natural haza	ards				
& Topics	Climatic h Prepared Risk asse	al hazards and mitigation nazards and mitigation m ness and responses to la essment and disaster ma	easures arge natural disasters nagement				
		(insurance) instruments	•				
Course Learning			course, students should be able to:				
Outcomes			and critical understanding of the ke ards, and technologies used to pro		atural hazards, the		
Pre-requisites and Co-requisites and Impermissible combinations)	Pass in E	ASC2404 or ENVS2001	or ENVS2002				
Offer in 2020 - 2021	N Off	fer in 2021 - 2022 : Y		Examination			
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery of the course material. Show strong ability for analytical, critical and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Demonstrate highly effective organizational and presentational skills.						
(* 33.)	В	Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and situations. Show evidence of analytical, critical thought to some complex issues. Apply effective orga presentational skills.					
					•		
	С	Demonstrate general but i situations. Show evidence presentational skills.	ncomplete command of the course mate of some critical and logical thinking a	abilities. Apply moderately effective	edge to most familiar ve organizational and		
	C D	Demonstrate general but i situations. Show evidence presentational skills. Demonstrate partial but limi	of some critical and logical thinking a ted command of the course material and a and logical thinking, but with limited analy	abilities. Apply moderately effective limited ability to apply knowledge to	edge to most familiar re organizational and solve problems. Shov		
		Demonstrate general but i situations. Show evidence presentational skills. Demonstrate partial but limi evidence of some coherent organizational and presenta Demonstrate little or no ev	of some critical and logical thinking a ted command of the course material and a and logical thinking, but with limited analy	abilities. Apply moderately effective limited ability to apply knowledge to ytical and critical abilities. Apply limited with very little or no ability to app	edge to most familia ye organizational and o solve problems. Show lited or barely effective ly knowledge to solve		
Course Type	D Fail	Demonstrate general but i situations. Show evidence presentational skills. Demonstrate partial but limi evidence of some coherent organizational and presenta Demonstrate little or no ev problems. Lack of critical th	of some critical and logical thinking a ted command of the course material and a and logical thinking, but with limited analy titional skills. vidence of command of course material v	abilities. Apply moderately effective limited ability to apply knowledge to ytical and critical abilities. Apply limited with very little or no ability to app	edge to most familiar ye organizational and o solve problems. Show lited or barely effective ly knowledge to solve		
Course Teaching	D Fail	Demonstrate general but i situations. Show evidence presentational skills. Demonstrate partial but limi evidence of some coherent organizational and presenta Demonstrate little or no ev problems. Lack of critical th or ineffective.	of some critical and logical thinking a ted command of the course material and a and logical thinking, but with limited analy titional skills. vidence of command of course material v	abilities. Apply moderately effective limited ability to apply knowledge to ytical and critical abilities. Apply limited with very little or no ability to app	edge to most familia ye organizational and o solve problems. Show lited or barely effective ly knowledge to solve		
Course Teaching	D Fail	Demonstrate general but i situations. Show evidence presentational skills. Demonstrate partial but limi evidence of some coherent organizational and presenta Demonstrate little or no ev problems. Lack of critical th or ineffective.	of some critical and logical thinking a ted command of the course material and a and logical thinking, but with limited analy tional skills. vidence of command of course material v inking abilities and incoherent thinking. Or	abilities. Apply moderately effective limited ability to apply knowledge to ytical and critical abilities. Apply limited with very little or no ability to app	edge to most familiar ve organizational and ve organizational and ve solve problems. Show ited or barely effective ly knowledge to solve are minimally effective No. of Hours 24		
Course Teaching	D Fail Lecture-b Activitie Lectures Tutorials	Demonstrate general but i situations. Show evidence presentational skills. Demonstrate partial but limi evidence of some coherent organizational and presenta Demonstrate little or no ev problems. Lack of critical the or ineffective.	of some critical and logical thinking a ted command of the course material and a and logical thinking, but with limited analytional skills. Vidence of command of course material vinking abilities and incoherent thinking. On Details Project tutorials	abilities. Apply moderately effective limited ability to apply knowledge to ytical and critical abilities. Apply limited with very little or no ability to app	edge to most familiar ve organizational and ve organizational and ve organizational and ve organizational and ve organizational and ve organizational and ve organizational and ve organizational and ve organizational ve organization ve org		
Course Teaching	D Fail Lecture-b Activitie: Lectures Tutorials Discussion	Demonstrate general but i situations. Show evidence presentational skills. Demonstrate partial but limi evidence of some coherent organizational and presenta Demonstrate little or no ev problems. Lack of critical thor ineffective. sased course s	of some critical and logical thinking a ted command of the course material and a and logical thinking, but with limited analytional skills. vidence of command of course material vinking abilities and incoherent thinking. On	abilities. Apply moderately effective limited ability to apply knowledge to ytical and critical abilities. Apply limited with very little or no ability to app	edge to most familia ve organizational and o solve problems. Show inted or barely effective ly knowledge to solve are minimally effective No. of Hours 24 8 16		
Course Teaching	D Fail Lecture-b Activitie: Lectures Tutorials Discussion	Demonstrate general but i situations. Show evidence presentational skills. Demonstrate partial but limi evidence of some coherent organizational and presenta Demonstrate little or no ev problems. Lack of critical the or ineffective.	of some critical and logical thinking a ted command of the course material and a and logical thinking, but with limited analytional skills. Vidence of command of course material vinking abilities and incoherent thinking. On Details Project tutorials	abilities. Apply moderately effective limited ability to apply knowledge to ytical and critical abilities. Apply limited with very little or no ability to app	edge to most familiar ve organizational and ve organizational and ve organizational and ve organizational and ve organizational and ve organizational and ve organizational and ve organizational and ve organizational ve organization ve org		
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	D Fail Lecture-b Activitie: Lectures Tutorials Discussion	Demonstrate general but i situations. Show evidence presentational skills. Demonstrate partial but limi evidence of some coherent organizational and presenta Demonstrate little or no ev problems. Lack of critical thor ineffective. Passed course s	of some critical and logical thinking a ted command of the course material and a and logical thinking, but with limited analytional skills. Vidence of command of course material vinking abilities and incoherent thinking. On Details Project tutorials	abilities. Apply moderately effective limited ability to apply knowledge to ytical and critical abilities. Apply limited with very little or no ability to app	edge to most familiar ve organizational and		

	Test	Four in-class quizzes (20%) and one in-class final examination (40%)	60	CLO 1
Required/recommended reading and online materials	Bryant E.: Natural Hazards (Camb	Assessing Risk and Reducing Disas ridge University Press, 2005) Hazards and Diasters (Amazon, 2009	,	
Additional Course Information	Previous course code: ENVS2007	·		

ENVS3042	Pollution (6 credits) Academic Year						
Offering Department	Earth Scie	nces		Quota	50		
Course Co-ordinator	Dr B Thibo	deau, Earth Sciences	(bthib@hku.hk)				
Teachers Involved	(Dr B Thibodeau,Earth Sciences)						
Course Objectives	This multi-disciplinary course will introduce students to the most important physical, chemical and biological contaminants that pollute the environment. The course will provide the basics of contaminant transport, toxicology pollution monitoring and environmental risk assessment. The course will also explore in details different mechanisms and pathways for water, atmosphere, soil and land pollution. The student will also be invited to reflect on the socio-economic aspect of pollution and remediation.						
Course Contents & Topics Course Learning Outcomes	Physical-C Physical, C Contamina Environme Water Poll Atmosphe Soil, Land Urban and Monitoring Introductic Global sys On succes CLO 1 ii CLO 2 c CLO 3 c	Overview of Global Pollution Physical-Chemical Characteristic of Soils, water and the atmosphere Physical, Chemical and Biological Contaminants Contaminants Transport Processes Environmental Toxicology Water Pollution Atmospheric Pollution Soil, Land and subsurface Pollution Urban and Household pollution Monitoring and Risk Assessment Strategy Introduction to remediation, restoration, treatment and reuse Global system and the human dimensions to environmental pollution On successful completion of this course, students should be able to: CLO 1 identify the most important pollutants CLO 2 describe the mechanisms responsible for the transport of pollutants in the environment CLO 3 evaluate the environmental toxicity of different type of contamination					
	CLO 4 present the most important cases of environmental pollution CLO 5 analyze lab-generated data and communicate the results and interpretations						
Pre-requisites (and Co-requisites and Impermissible combinations)			1 or BIOL2103 or ENVS2001	Evening	No Evom		
Offer in 2020 - 2021		sem Offer in 2021 - 2		Examination	No Exam		
Grade Descriptors (A+ to F)	A	original thought. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.					
יאי נטון	В	of results to draw appropriate conclusions. Apply effective organizational and presentational skills. C Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking.					
(5. 101)	В	Demonstrate general but in	ate conclusions. Apply effective organization complete grasp of the subject. Evidence	onal and presentational skills. of some analytical and critical abil	ities and logical thinking		
(c. w.)	С	Demonstrate general but in Mostly correct but some organizational and presenta	ate conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills.	onal and presentational skills. of some analytical and critical abil draw appropriate conclusions. App	ities and logical thinking oly moderately effective		
(2. 10.1)	C	Demonstrate general but in Mostly correct but some organizational and present Demonstrate partial but lim logical thinking, but with I conclusions. Apply limited of	ate conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills. ited grasp, with retention of some relevant imited analytical and critical abilities. Lire or barely effective organizational and press	and and presentational skills. of some analytical and critical abil fraw appropriate conclusions. Appl t information, of the subject. Eviden mited ability to use data and resu entational skills.	ities and logical thinking oly moderately effective ce of some coherent an ults to draw appropriate		
(0. 101)	С	Demonstrate general but in Mostly correct but some organizational and presents Demonstrate partial but lim logical thinking, but with I conclusions. Apply limited or Demonstrate evidence of analytical and critical abili	ate conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills. ited grasp, with retention of some relevant imited analytical and critical abilities. Lir	onal and presentational skills. of some analytical and critical abildraw appropriate conclusions. Applet information, of the subject. Evidenmited ability to use data and restrentational skills. understanding of the subject. Evise of data and results and/or una	titles and logical thinking oly moderately effective ce of some coherent an ults to draw appropriate dence of little or lack o		
	C D Fail	Demonstrate general but in Mostly correct but some organizational and presents Demonstrate partial but lim logical thinking, but with I conclusions. Apply limited or Demonstrate evidence of analytical and critical abili	ate conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills. ited grasp, with retention of some relevant imited analytical and critical abilities. Listor barely effective organizational and presultitle or no grasp of the knowledge and ties, logical and coherent thinking. Misus	onal and presentational skills. of some analytical and critical abildraw appropriate conclusions. Applet information, of the subject. Evidenmited ability to use data and restrentational skills. understanding of the subject. Evise of data and results and/or una	titles and logical thinking oly moderately effective ce of some coherent an ults to draw appropriate dence of little or lack o		
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Course Type Course Teaching	D Fail Lecture-ba	Demonstrate general but in Mostly correct but some organizational and presents. Demonstrate partial but lim logical thinking, but with I conclusions. Apply limited of Demonstrate evidence of analytical and critical abiliticonclusions. Organization assed course	ate conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills. ited grasp, with retention of some relevant imited analytical and critical abilities. Linor barely effective organizational and preservatite or no grasp of the knowledge and ties, logical and coherent thinking. Misus and presentational skills are minimally efference.	onal and presentational skills. of some analytical and critical abildraw appropriate conclusions. Applet information, of the subject. Evidenmited ability to use data and restrentational skills. understanding of the subject. Evise of data and results and/or una	ities and logical thinking oly moderately effective ce of some coherent an ults to draw appropriate dence of little or lack o ble to draw appropriate No. of Hours 24		
Course Type Course Teaching	D Fail Lecture-ba Activities Lectures Tutorials	Demonstrate general but in Mostly correct but some organizational and presents. Demonstrate partial but lim logical thinking, but with 1 conclusions. Apply limited of Demonstrate evidence of analytical and critical ability conclusions. Organization assed course	ate conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills. ited grasp, with retention of some relevant imited analytical and critical abilities. Linor barely effective organizational and preservatite or no grasp of the knowledge and ties, logical and coherent thinking. Misus and presentational skills are minimally efference.	onal and presentational skills. of some analytical and critical abildraw appropriate conclusions. Applet information, of the subject. Evidenmited ability to use data and restrentational skills. understanding of the subject. Evise of data and results and/or una	ities and logical thinking oly moderately effective ce of some coherent an ults to draw appropriate dence of little or lack oble to draw appropriate No. of Hours 24 24		
Course Type Course Teaching & Learning Activities	C D Fail Lecture-ba Activities Lectures Tutorials Reading /	Demonstrate general but in Mostly correct but some organizational and presents. Demonstrate partial but lim logical thinking, but with I conclusions. Apply limited of Demonstrate evidence of analytical and critical abiliticonclusions. Organization assed course	te conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills. ited grasp, with retention of some relevant imited analytical and critical abilities. Lire or barely effective organizational and pressilitie or no grasp of the knowledge and ties, logical and coherent thinking. Misus and presentational skills are minimally efferments.	onal and presentational skills. of some analytical and critical abil draw appropriate conclusions. Apil traw appropriate conclusions. Apil tinformation, of the subject. Eviden mited ability to use data and resu entational skills. understanding of the subject. Evi se of data and results and/or una ctive or ineffective.	ities and logical thinking oly moderately effective ce of some coherent an ults to draw appropriate dence of little or lack oble to draw appropriate No. of Hours 24 24 92		
Course Type Course Teaching & Learning Activities Assessment Methods	D Fail Lecture-ba Activities Lectures Tutorials	Demonstrate general but in Mostly correct but some organizational and presents. Demonstrate partial but lim logical thinking, but with 1 conclusions. Apply limited of Demonstrate evidence of analytical and critical ability conclusions. Organization assed course	ate conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills. ited grasp, with retention of some relevant imited analytical and critical abilities. Linor barely effective organizational and preservatite or no grasp of the knowledge and ties, logical and coherent thinking. Misus and presentational skills are minimally efference.	onal and presentational skills. of some analytical and critical abildraw appropriate conclusions. Applet information, of the subject. Evidenmited ability to use data and restrentational skills. understanding of the subject. Evise of data and results and/or una	ities and logical thinking oly moderately effective ce of some coherent an ults to draw appropriate dence of little or lack oble to draw appropriate No. of Hours 24 24		
Course Type Course Teaching & Learning Activities Assessment Methods	C D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods	Demonstrate general but in Mostly correct but some organizational and present Demonstrate partial but lim logical thinking, but with I conclusions. Apply limited of Demonstrate evidence of analytical and critical abiliconclusions. Organization assed course	te conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills. ited grasp, with retention of some relevant imited analytical and critical abilities. Lire or barely effective organizational and pressilitie or no grasp of the knowledge and ties, logical and coherent thinking. Misus and presentational skills are minimally efferments.	onal and presentational skills. of some analytical and critical abil draw appropriate conclusions. Appl t information, of the subject. Eviden mited ability to use data and rest entational skills. understanding of the subject. Evise e of data and results and/or una ctive or ineffective. Weighting in final course grade (%)	ities and logical thinking oly moderately effective ce of some coherent an ults to draw appropriate dence of little or lack olble to draw appropriate No. of Hours 24 24 92 Assessment Methods to CLO Mapping		
Course Type Course Teaching & Learning Activities Assessment Methods	C D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme	Demonstrate general but in Mostly correct but some organizational and presents Demonstrate partial but lim logical thinking, but with I conclusions. Apply limited constrate evidence of analytical and critical abiliconclusions. Organization assed course Self study	te conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills. ited grasp, with retention of some relevant imited analytical and critical abilities. Lire or barely effective organizational and pressilitie or no grasp of the knowledge and ties, logical and coherent thinking. Misus and presentational skills are minimally efferments.	onal and presentational skills. of some analytical and critical abil draw appropriate conclusions. Appl t information, of the subject. Eviden mitted ability to use data and rest entational skills. understanding of the subject. Evi se of data and results and/or una ctitive or ineffective. Weighting in final course grade (%)	ities and logical thinking oly moderately effective ce of some coherent an alts to draw appropriate dence of little or lack oble to draw appropriate No. of Hours 24 24 92 Assessment Methods to CLO Mapping CLO 1,2,3,4,5		
Course Type Course Teaching & Learning Activities Assessment Methods	C D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Presentat	Demonstrate general but in Mostly correct but some organizational and presents Demonstrate partial but lim logical thinking, but with 1 conclusions. Apply limited of Demonstrate evidence of analytical and critical abiliconclusions. Organization assed course Self study	te conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills. ited grasp, with retention of some relevant imited analytical and critical abilities. Lire or barely effective organizational and pressilitie or no grasp of the knowledge and ties, logical and coherent thinking. Misus and presentational skills are minimally efferments.	onal and presentational skills. of some analytical and critical abil draw appropriate conclusions. Appl t information, of the subject. Eviden mitted ability to use data and resu entational skills. understanding of the subject. Evise eof data and results and/or una ctive or ineffective. Weighting in final course grade (%) 50 20	No. of Hours 24 24 24 92 Assessment Methods to CLO 1,2,3,4,5 CLO 4,5		
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	C D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Presentat Project re	Demonstrate general but in Mostly correct but some organizational and presents Demonstrate partial but lim logical thinking, but with 1 conclusions. Apply limited of Demonstrate evidence of analytical and critical abiliconclusions. Organization assed course Self study Ints	ate conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills. Ited grasp, with retention of some relevant imited analytical and critical abilities. Lire barely effective organizational and presellitie or no grasp of the knowledge and ties, logical and coherent thinking. Misus and presentational skills are minimally effermentally.	onal and presentational skills. of some analytical and critical abil draw appropriate conclusions. Appl t information, of the subject. Eviden mitted ability to use data and rest entational skills. understanding of the subject. Evi se of data and results and/or una ctitive or ineffective. Weighting in final course grade (%)	ities and logical thinking oly moderately effective ce of some coherent an alts to draw appropriate dence of little or lack oble to draw appropriate No. of Hours 24 24 92 Assessment Methods to CLO Mapping CLO 1,2,3,4,5		
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	C D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Presentat Project re Environme	Demonstrate general but in Mostly correct but some organizational and presents. Demonstrate partial but lim logical thinking, but with 1 conclusions. Apply limited of Demonstrate evidence of analytical and critical ability conclusions. Organization assed course. Self study nts ion ports ental and Pollution Scie	te conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills. ited grasp, with retention of some relevant imited analytical and critical abilities. Lire or barely effective organizational and pressilitie or no grasp of the knowledge and ties, logical and coherent thinking. Misus and presentational skills are minimally efferments.	onal and presentational skills. of some analytical and critical abil draw appropriate conclusions. Api t information, of the subject. Eviden mited ability to use data and resu entational skills. understanding of the subject. Evi se of data and results and/or una ctive or ineffective. Weighting in final course grade (%) 50 20 30	No. of Hours 24 24 24 92 Assessment Methods to CLO 1,2,3,4,5 CLO 4,5		
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials Additional Course	C D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Presentat Project re Environme by Mark L.	Demonstrate general but in Mostly correct but some organizational and presents Demonstrate partial but lim logical thinking, but with I conclusions. Apply limited of Demonstrate evidence of analytical and critical ability conclusions. Organization assed course Self study Self study The Self study The Self study The Self study Self stud	the conclusions. Apply effective organization complete grasp of the subject. Evidence erroneous use of data and results to cational skills. ited grasp, with retention of some relevant imited analytical and critical abilities. Liror barely effective organizational and presentities or no grasp of the knowledge and ties, logical and coherent thinking. Misus and presentational skills are minimally effermentally. Details Details Details	onal and presentational skills. of some analytical and critical abil draw appropriate conclusions. Api t information, of the subject. Eviden mited ability to use data and resu entational skills. understanding of the subject. Evi se of data and results and/or una ctive or ineffective. Weighting in final course grade (%) 50 20 30	No. of Hours 24 24 24 92 Assessment Methods to CLO 1,2,3,4,5 CLO 4,5		

ENVS3313	Environmental oceanography (6 credits)	Academic Year	2020
Offering Department	Earth Sciences	Quota	
Course Co-ordinator	Dr M C Cheung, Earth Sciences (hmcc@hku.hk)		
Teachers Involved	(Dr D M Baker,Biological Sciences) (Dr M C Cheung,Earth Sciences) (Dr M Yasuhara,Biological Sciences)		
Course Objectives	To provide students with a thorough introduction to coastal and ocean processe importance of the (paleo)oceanographic processes to environmental and ecolo To convey the basic science behind ocean-atmosphere and ocean-biosphere	gical conditions.	0 0

Course Contents	context of human's connectedness and impact to the physical world. To provide a solid foundation of knowledge about the physical processes dictating the oceans movements and						
& Topics	their imp	acts on the environme	nt and ecosystems. The oceans take	e up 71% of earth's surface	and contain 98% o		
	the water. By looking at the structure of the atmosphere, thermodynamic principals and properties governing sea						
			tical roles the ocean plays in the en				
	(paleo)climate, coastal resources, and nutrient cycling. Case studies specifically examining char						
Danier I a amatan	rise, El Nino, and (paleo)climate will be used to connect oceanographic principles to environmental problems. On successful completion of this course, students should be able to:						
Course Learning		· · · · · · · · · · · · · · · · · · ·	,				
Outcomes			ace and deep currents of the ocean				
	tı	ransport	mportant processes in the ocean of				
	CLO 3 d	describe sources and d	listribution of critical chemicals and se	ea water properties in the c	cean		
			etween physical ocean processes, cl	imate systems and biologic	al activity		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	Pass in BIOL2306 or EASC2404 or ENVS2001 or ENVS2002					
Offer in 2020 - 2021	Y 2n	nd sem Offer in 2021	- 2022 : Y	Examination	May		
Grade Descriptors (A+ to F)	A	learning outcomes. Sho	nastery at an advanced level of extensive kn w ability to think logically and critically, with ate and insightful conclusions. Apply highly effe	evidence of original thought. Cri	tically evaluate data and		
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course						
	learning outcomes. Show evidence of logical and critical thought. Apply effective organizational and presentational skills.						
	Correctly use of data and results to draw appropriate conclusions. Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning						
	outcomes. Show evidence of some logical and critical thinking. Apply moderately effective organizational and presentational						
	skills. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.						
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited critical abilities. Apply limited or barely effective						
	organizational and presentational skills. Limited ability to use data and results to draw appropriate conclusions.						
	Fail	of critical, logical and/or	evidence of command of knowledge and skills coherent thinking. Organization and presental unable to draw appropriate conclusions.				
Course Type	Lecture v	with laboratory compor	nent course				
Course Teaching	Activitie	es	Details		No. of Hours		
& Learning Activities	Lectures	3	12 sessions x 2 hours	24			
	Laborato	ory	10 labs x 2 hours		20		
	Project v	work	group project	group project			
	Reading	/ Self study			90		
Assessment Methods and Weighting	Methods	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm	nents	Practical Exercises and Project	50	CLO 1,2,3,4		
	Examina	ation	2 hour written final exam	40	CLO 1,2,3,4		
	Test		Mid-term Exam	10	CLO 1,2,3		
Required/recommended reading and conline materials			: An Invitation to Marine Science. 5th Inderstanding Climate Change Past a		versity Press.		
Additional Course	Course v	will be offered every ye	ar starting from 2014-2015 and coord	linated by DES.			

ENVS3999	Directed studi	es in environ	mental so	cience (6	credits)		Academic Year	2020
Offering Department	Earth Sciences	ciences				Quota		
Course Co-ordinator	Dr C Dingle, Biolo	gical Sciences	(cdingle@h	ku.hk)				
Teachers Involved	(Various teachers (Various teachers)				
Course Objectives		To enhance students knowledge on a particular topic in environmental science and students self-directed learninç and critical thinking skills.						
Course Contents & Topics	material beyond	Students undertake extensive reading on a selected topic guided by a staff member. Reading should cover material beyond textbooks. Students are required to analyze the material read, formulate their own scientific argument, and present it in written form.						
Course Learning	On successful con	mpletion of this	course, stud	dents should	be able to:			
Outcomes	CLO 1 comple	te a research tas	sk independ	dently in one	or more topic	cal areas o	f the major	
	CLO 2 show co	ompetence in fo	rmulating th	eir own scie	entific argume	nt		
(and Co-requisites and Impermissible combinations)	Science Major. Cumulative GPA This capstone countries that a	urse is for Enviro	onmental So	cience Majo	r students onl		study.	
Offer in 2020 - 2021	Y 1st sem 2	2nd sem Offer	in 2021 - 20	022 : Y			Examination	No Exam
Grade Descriptors (A+ to F)	with evi to draw	idence of original the	ought. Insightfu Isightful conclu	ul use and criti usions. Presen	cal analysis of inf ted in high acad	ormation drav	t, logical analysis and vn from a full range o d. Work of A+ shoul	f high quality source:
	B Most aspects of the chosen topic were addressed and researched adequately. Demonstrates understanding of most key concepts, evidence of elementary analysis and development of argument. Critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations. Presented in adequate standard.							
	Demonstrate general but incomplete grasp of the chosen topic. Most aspects of the chosen topic were addressed and researched at a very basic level. Mostly correct but some erroneous use of relevant information from sources, demonstrates mainly description, and shows basic understanding, but lacking depth.							
	coherer	nt and İogical thinkir	ng, but with lim	nited analytical	and critical abiliti	ies. Demonsti	relevant information rate use and reference ropriate conclusions	e of several sources
							e of little or lack of a	

	results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective					
Course Type	Project-based course					
Course Teaching	Activities	Details		No. of Hours		
& Learning Activities	Reading / Self study	research work & report		120		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Oral presentation		20	CLO 1,2		
	Research report		80	CLO 1,2		

ENVS4955	Environr	mental science	in practice (6 credits)	Academic Ye	ar 2020		
Offering Department	Earth Scie		· · · · · · · · · · · · · · · · · · ·	Quota	8		
Course Co-ordinator	Dr M Yasu	ıhara, Biological So	ciences (yasuhara @hku.hk)				
Teachers Involved	(Dr M Yası	uhara,Biological So	ciences)				
Course Objectives		To provide students experiential learning experience in the field of environmental science. The course is primarily based on an array of experiential studies covering essential areas of environmental science during a residential					
Course Contents & Topics	residential sampling, geology/pa	Students to attend a residential field trip outside Hong Kong to learn about environmental science in practice. The residential field trip will be, for example, to Japan and may include marine environmental survey, sediment core sampling, practical learning of ecological, paleoecology and environmental problems, environmental geology/paleontology excursion, and other activities. Students are required to write an independent report on an environmental science issue.					
Course Learning	On succes	sful completion of	this course, students should be abl	e to:			
Outcomes	CLO 1	recognize ways	of environmental science in practice	е			
	CLO 2	gain knowledge	of current environmental problems	and solutions			
	CLO 3	present and com	municate their field observations a	nd findings			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in at Science M		of advanced level (level 3 or 4) d	disciplinary core/elective course	es in Environmental		
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 :	N	Examination			
Grade Descriptors (A+ to F)	Α	original thought. Appl and insightful conclus	h grasp of the subject. Show strong analy y highly effective lab / fieldwork skills and t ions. Apply highly effective organizational ar	techniques. Critical use of data and res nd presentational skills.	sults to draw appropriate		
	В	B Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Apply effective lab / fieldwork skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.					
	С	Apply moderately effective lab / fieldwork skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Apply partially effective lab / fieldwork skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.					
	Fail	Demonstrate evidence analytical and critical	ee of little or no grasp of the knowledge a abilities, logical and coherent thinking. Ap f data and results and/or unable to draw app ineffective	oply minimally effective or ineffective la	ab / fieldwork skills and		
Course Type	Laboratory	and workshop co					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Field work		Field work and other learnin least 66 hours of field trips a	66			
	Reading /	Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Laborator	y reports	field reports	30	CLO 1,2,3		
	Presentati		group presentations	30	CLO 1,2,3		
	Project rep	ports	individual report	40	CLO 1,2,3		
Course Website		v.biosch.hku.hk/ecc			, , .		
Additional Course			actual capacity of this course is lin	nited and will vary year by yea	r regardless of the		
Information	quota set. So, interested student must apply for the course with a short proposal (2 pages maximum) and CV via e-mail to Dr. Moriaki Yasuhara (yasuhara@hku.hk) and Ms. Maria Lo (gylo@hku.hk) not later than 1st August (Note: this is 2nd semester course, but we need applications well in advance, on or before this date). Late applications will not be accepted. The proposal should include the following: (1) the specific reason(s)/motivation why you are interested in joining this course; (2) merit that you expect to receive from this course, especially regarding your future academic/career path; (3) brief description of academic interests. The CV should include: (1) Personal and academic details; (2) ID photograph; (4) GPA; (5) Pre-requisite courses taken and grades received. The selection will be made based on the quality of proposal and the justification of academic merit, in considering other factors. Only accepted students through this application process will be able to register this course.						
	The reside	ential field trip will b	pe organized in the reading week. See contact us for details and financi	Students will need to pay for the			

ENVS4966	Environmental science internship (6 credits)	Academic Year	2020
Offering Department	Earth Sciences	Quota	
Course Co-ordinator	Dr C Dingle, Biological Sciences (cdingle@hku.hk)		
Teachers Involved	(Dr C Dingle, Biological Sciences)		
Course Objectives	This course offers students the opportunity to gain work experience related	o their major of	study. This work

	experience will allow the students to apply their knowledge gained in their studies to the real environmental issues.					
Course Contents & Topics	In the case of the work being carried out in an external agency, students will be supervised by a staff member of the external agency (the External Supervisor) and a staff member of the University (the Internal Supervisor). If the work is carried out within HKU, there is no need for an additional internal supervisor. The work to be performed by students will normally be instructed by the External Supervisor, with prior agreement of the Internal Supervisor.					
Course Learning	On successful completion of this course, students should be able to:					
Outcomes				ntal-related firm or the Governme	ent	
			ing and appreciation of the rea			
			, .	edge to solving real world problen		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in Environmental Science Major. This capstone course is for Environmental Science Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.					
Offer in 2020 - 2021	Y 1st se	em 2nd sem Sun	nmer Offer in 2021 - 2022 : `	Y Examination	No Exam	
Grade Descriptors (Pass /Pass with distinction /Fail)	Distincti on	performance in handli effective collaboration	ng and carrying out the work requi and communication with supervisor the Course Description regarding wo	to solve problems in the workplace. ired in the job or assigned by supervising, colleagues, and clients in the job. orking hours, with excellent performance	or(s). Establishes highly Successfully fulfills the	
,	Pass					
	Fail Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required in the job or assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other colleagues, or clients in the job. Fails to satisfy the requirements set out in the Course Description regarding working hours, written and oral report, or evaluation by supervisor(s), etc.					
Course Type	Internship					
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Internship v	vork	it is expected that students (or the equivalent of 4 wee	160		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Oral preser	ntation		10	CLO 3	
	Supervisor'	s feedback		20	CLO 1,2	
	Written report			70	CLO 1,2,3	
Course Website	http://moodl	e.hku.hk/				
Additional Course Information	of 4 weeks to Satisfactory be recorded interested to Enrolment of	http://moodle.hku.hk/ No formal lecture is to be given, but it is expected that students are to work for at least 160 hours (or the equivalent of 4 weeks full-time), supervised by a staff member. Satisfactory completion of this course can be counted towards the Capstone requirement. Details of internship will be recorded on the student's transcript. This course will be assessed on "Pass/Fail" basis. Students who are interested to enrol in this course should contact the Department to obtain the approval. Enrolment of this course is not conducted via the online course selection system and should be made through the relevant Department/School office after approval has been obtained from the course coordinator.				

ENVS4999	Enviror	nmental science proje	ect (12 credits)	Academic Year	2020	
Offering Department	Earth Sci	iences	•	Quota		
Course Co-ordinator	Dr C Din	gle, Biological Sciences (d	cdingle @hku.hk)			
Teachers Involved		teachers (ERS), Earth Sci teachers (SBS), Biological				
Course Objectives	To enhar	nce students knowledge a	nd research skills in advanced lev	el of environmental science.		
Course Contents & Topics	member.	Students undertake a research project in the form of an undergraduate dissertation under the supervision of a staff member. The project could be based on one of the four areas covered by the major and must show elements of interdisciplinary nature. The dissertation should show an element of originality and the research in a non-trivial manner				
Course Learning	On succe	essful completion of this c	ourse, students should be able to	:		
Outcomes	CLO 1	complete a dissertation pr	oject of undergraduate level in on	e of the four areas of the major	or	
	CLO 2	show competence in form	ulation, data collection, analysis,	and presentation of a research	n project	
Pre-requisites (and Co-requisites and Impermissible combinations)	Science Students This caps	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in Environmental Science Major; and Students must have a cumulative GPA of 3.0 or above in Environmental Science Major. This capstone course is for Environmental Science Major students only. The earliest that a student is allowed to take this capstone course is their year 3 study.				
Offer in 2020 - 2021		ear long Offer in 2021 - 2	•	Examination	No Exam	
Grade Descriptors (A+ to F)	Α	A Demonstrates excellent understanding of the topic, excellent development of argument, logical analysis and insight into the top with evidence of original thought. Insightful use and critical analysis of information drawn from a full range of high quality source to draw appropriate and insightful conclusions. Presented in high academic standard. [Work of A+ should show considerab additional work beyond that is required in wider areas relevant to the topic.]				
(A+ to F)		to draw appropriate and ins	ught. Insightful use and critical analysis of ightful conclusions. Presented in high ac	information drawn from a full range of ademic standard. [Work of A+ shou	of high quality sources	
(A+ to F)	В	to draw appropriate and ins additional work beyond that i Most aspects of the chose concepts, evidence of elem	ught. Insightful use and critical analysis of ightful conclusions. Presented in high ac	information drawn from a full range of ademic standard. [Work of A+ shou opic.] dadequately. Demonstrates unders unders. Critical use of relevant informations.	of high quality sources Id show considerable tanding of most key mation from sources,	
(A+ to F)	В	to draw appropriate and ins additional work beyond that i Most aspects of the chose concepts, evidence of elem showing ability to make mea Demonstrate general but in researched at a very basic	ight. Insightful use and critical analysis of ightful conclusions. Presented in high ac s required in wider areas relevant to the to n topic were addressed and researched entary analysis and development of argi	information drawn from a full range of ademic standard. [Work of A+ shouppic.] of adequately. Demonstrates unders ument. Critical use of relevant infor condary interpretations. Presented in Most aspects of the chosen topic of suse of relevant information from so	of high quality sources ld show considerable tanding of most key mation from sources, adequate standard. were addressed and	
(A+ to F)		to draw appropriate and ins additional work beyond that i Most aspects of the chose concepts, evidence of elem showing ability to make mea Demonstrate general but ir researched at a very basic mainly description, and show Demonstrate partial but lim coherent and logical thinking	ight. Insightful use and critical analysis of ightful conclusions. Presented in high ac s required in wider areas relevant to the to in topic were addressed and researched entary analysis and development of arguingful comparisons between different sec incomplete grasp of the chosen topic. In level. Mostly correct but some erroneous	information drawn from a full range of ademic standard. [Work of A+ shouppic.] of adequately. Demonstrates unders ument. Critical use of relevant informondary interpretations. Presented in Most aspects of the chosen topic of suse of relevant information from some tention of some relevant information fillities. Demonstrate use and reference added to the chosen topic of the chosen topi	of high quality sources id show considerable tanding of most key mation from sources, adequate standard. were addressed and ources, demonstrates n. Evidence of some be of several sources,	
(A+ to F)	С	to draw appropriate and ins additional work beyond that i Most aspects of the chose concepts, evidence of elem showing ability to make mea Demonstrate general but in researched at a very basic mainly description, and show Demonstrate partial but lim coherent and logical thinking but mainly through summary Show little or no grasp of the abilities, logical and coherent.	ight. Insightful use and critical analysis of ightful conclusions. Presented in high ac s required in wider areas relevant to the to n topic were addressed and researched entary analysis and development of arg iningful comparisons between different sec accomplete grasp of the chosen topic. No level. Mostly correct but some erroneous is basic understanding, but lacking depth. ited grasp of the chosen topic, with ret by but with limited analytical and critical ab	information drawn from a full range of ademic standard. [Work of A+ shouppic.] d adequately. Demonstrates unders ument. Critical use of relevant informondary interpretations. Presented in Most aspects of the chosen topic via use of relevant information from some tention of some relevant information from some tention of some relevant information itied to draw appropriate conclusions subject. Evidence of little or lack of the sand no critical comparison of there are no calculations.	of high quality sources and show considerable tanding of most key mation from sources, adequate standard. were addressed and ources, demonstrates an Evidence of some the sources, from the sources, from the sources. Misuse of data and it.	
, ,	C D Fail	to draw appropriate and ins additional work beyond that i Most aspects of the chose concepts, evidence of elem showing ability to make mea Demonstrate general but in researched at a very basic mainly description, and show Demonstrate partial but lim coherent and logical thinking but mainly through summary Show little or no grasp of the abilities, logical and coherent.	ught. Insightful use and critical analysis of gightful conclusions. Presented in high as required in wider areas relevant to the tentopic were addressed and researched entary analysis and development of arguningful comparisons between different seconomplete grasp of the chosen topic. Nelevel. Mostly correct but some erroneous is basic understanding, but lacking depthied grasp of the chosen topic, with retiging the post of the chosen topic. New the tentopic with the properties of the chosen topic with retiging the properties of the chosen topic. The properties of the chosen topic with retiging the properties of the chosen topic. The properties of the chosen topic with retiging the properties of the chosen topic. The properties of the chosen topic. The chosen topic with retiging the chosen topic. The properties of the chosen topic with the properties of the chosen topic.	information drawn from a full range of ademic standard. [Work of A+ shouppic.] d adequately. Demonstrates unders ument. Critical use of relevant informondary interpretations. Presented in Most aspects of the chosen topic via use of relevant information from some tention of some relevant information from some tention of some relevant information itied to draw appropriate conclusions subject. Evidence of little or lack of the sand no critical comparison of there are no calculations.	of high quality sources id show considerable tanding of most key mation from sources, adequate standard. were addressed and ources, demonstrates an Evidence of some ce of several sources, from the sources. analytical and critical m. Misuse of data and	
Course Type Course Teaching & Learning Activities	C D Fail	to draw appropriate and ins additional work beyond that i Most aspects of the chose concepts, evidence of elem showing ability to make mea Demonstrate general but in researched at a very basic mainly description, and show Demonstrate partial but lim coherent and logical thinking but mainly through summary Show little or no grasp of the abilities, logical and coheren results and/or unable to draw assed course	ught. Insightful use and critical analysis of gightful conclusions. Presented in high as required in wider areas relevant to the tentopic were addressed and researched entary analysis and development of arguningful comparisons between different seconomplete grasp of the chosen topic. Nelevel. Mostly correct but some erroneous is basic understanding, but lacking depthied grasp of the chosen topic, with retiging the post of the chosen topic. New the tentopic with the properties of the chosen topic with retiging the properties of the chosen topic. The properties of the chosen topic with retiging the properties of the chosen topic. The properties of the chosen topic with retiging the properties of the chosen topic. The properties of the chosen topic. The chosen topic with retiging the chosen topic. The properties of the chosen topic with the properties of the chosen topic.	information drawn from a full range of ademic standard. [Work of A+ shouppic.] d adequately. Demonstrates unders ument. Critical use of relevant informondary interpretations. Presented in Most aspects of the chosen topic via use of relevant information from some tention of some relevant information from some tention of some relevant information itied to draw appropriate conclusions subject. Evidence of little or lack of the sand no critical comparison of there are no calculations.	of high quality sources id show considerable tanding of most key mation from sources, adequate standard. were addressed and ources, demonstrates an Evidence of some ce of several sources, from the sources. analytical and critical m. Misuse of data and	

Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Dissertation		80	CLO 1,2
	Oral presentation		20	CLO 2
Additional Course Information	Previous course code: ENVS3015 Consent from major coordinator is			

MATH1009	Basic mathematics for business and economics (6 credits) Academic Y							
Offering Department	Mathemati			Quota	440			
Course Co-ordinator		· Y M Chan (1st sem); Dr K H Law (2nd sem), Mathematics <i>(ymchan @maths.hku.hk; lawkaho @connect.hku.hk</i>						
Teachers Involved	(Dr Y M Cl	(Dr K H Law,Mathematics) (Dr Y M Chan,Mathematics)						
Course Objectives	Business application	This course aims at introducing important topics of mathematics for introductory or intermediate level courses in Business and Economics. Mathematical concepts and methods, as well as some Business and Economics applications, would be emphasized so that students could be furnished with the essential mathematical skills for the senior courses in these disciplines.						
Course Contents & Topics	3. Quadrat 4. Graphs 5. Differen 6. Unconst 7. Partial d 8. Constra 9. Integrati 10. Geome 11. Differe 12. Differe	. Logic . Linear Equations . Quadratic Equations . Graphs and Functions . Differentiation . Unconstrained optimization . Partial differentiation . Constrained optimization . Integration 0. Geometric series 1. Difference equations (optional) 2. Differential equations (optional) 3. Matrix algebra (optional)						
Course Learning Outcomes	CLO 1 de CLO 2 ap	monstrate knowledge a ply mathematical skills t	ourse, students should be able to: nd understanding of the essential ma to model and solve basic problems in g with a higher level of mathematics r	business and economic	S			
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL The course Mathemati in these co	CLO 3 be more capable of coping with a higher level of mathematics required in various economic disciplines NIL The course has no pre-requisite, but students are expected to have already achieved Level 2 or above in HKDSE Mathematics or equivalent. Not for students who have passed MATH1011 or MATH1013, or have already enrolled in these courses. This course is exclusively for non-Science and non-Engineering students (i.e. not for students from the Faculty of Science or Engineering).						
Offer in 2020 - 2021		sem 2nd sem Offer i	in 2021 - 2022 : Y	Examination	Dec May			
Grade Descriptors (A+ to F)	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and the applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentat and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems. B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and the applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors. C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorem but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument a presentation or a number of minor computational errors. D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but we substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation with substantial computational errors. Fail Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or							
Course Type	Lecture-ba	sed course						
Course Teaching	Activities		Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials	0 15 1 1			12			
A		Self study	D. ()	M	100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignme	nts	Tutorials and Assignments	10	CLO 1,2,3			
	Examinati			50	CLO 1,2,3			
	Test			40	CLO 1,2,3			
Required/recommended reading and online materials	M. J. Ross Martin Ant Methods a	Martin Anthony and Norman Biggs: Mathematics for Economics and Business (New York: Pearson Education, 2018, 9th edition) M. J. Rosser: Basic Mathematics for Economists (London: Routledge, 2003, 2nd edition) Martin Anthony and Norman Biggs: Mathematics for Economics and Finance: Methods and Modelling (Cambridge: Cambridge University Press, 1996)						
Course Website		dle.hku.hk/						
Additional Course Information			table/timetable2021_S1.pdf					

MATH1011	University mathematics I (6 credits)	Academic Year	2020
Offering Department	Mathematics	Quota	400
Course Co-ordinator	Dr H Y Zhang, Mathematics (hyzhang@maths.hku.hk)		
Teachers Involved	(Dr H Y Zhang,Mathematics)		
Course Objectives	This course aims at students with only HKDSE Mathematics (or equivalent) be basic knowledge of mathematics that serves as essential foundation in various followed by MATH1013.		
Course Contents & Topics	 Sets, Venn diagram, set operations. Permutations, combinations and elementary probabilities. Mathematical induction. Exponential and logarithmic functions. Trigonometric functions, trigonometric formulae. Limits of algebraic, exponential and logarithmic functions. Derivatives of algebraic, exponential and logarithmic functions. Differentiation rules: addition, product, quotient and chain rule. 		

		and minima. e and definite integrals				
	- Area.- Integration by substitution.- Trapezoidal rule with error estimation.					
Course Learning	On succe		s course, students should be able t			
Outcomes	CLO 1		calculate probabilities; and prove I			
	CLO 2		ing exponential, logarithmic and tri	gonometric functions		
	CLO 3	evaluate limits and de				
	CLO 4		ite and indefinite integrals			
	CLO 5		ms such as determining maxima ar			
Pre-requisites (and Co-requisites and Impermissible combinations)	passed o		(a) with Level 2 or above in M1 any of following courses: MATH1011853.			
Offer in 2020 - 2021	Y 1st	sem 2nd sem Offe	er in 2021 - 2022 : Y	Examination	n Dec May	
Grade Descriptors (A+ to F)	A	applications through corre	t understanding of key concepts and ideas ectly analysing problems, clearly and elega at computations carefully and correctly, and	ntly presenting correct logical rea	soning and argumentation	
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and the applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriat theorems or their applications and presentation or with some minor computational errors.					
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.					
	D Fail	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.				
		being able to complete the		to lability appropriate allocionio	or area approauerie, er rie	
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	S	Details	No. of Hours		
& Learning Activities	Lectures				36	
	Tutorials				12	
		/ Self study			100	
Assessment Methods and Weighting	Methods	i	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents	assignments, tutorials, participation, etc	5	CLO 1,2,3,4,5	
	Examina	tion		50	CLO 1,2,3,4,5	
			3 tests	45	CLO 1,2,3,4,5	
Required/recommended reading and online materials						
Course Website	http://mod	odle.hku.hk/				
Additional Course	Timetable	:				
Information			netable/timetable2021_S1.pdf netable/timetable2021_S2.pdf			

MATH1013	Universi	ity mathemation	ics II (6 credits)	Academic Year	2020		
Offering Department	Mathemat	tics		Quota	500		
Course Co-ordinator	Dr C W W	ong, Mathematic	cs (cwwongab@hku.hk)				
Teachers Involved	(Dr C W V	Vong,Mathematic	cs)				
Course Objectives	backgrour various d	nd and provides t	them with basic knowledge of context expected to be followed by context of the co	plus Module 1 or Core Mathematic alculus and some linear algebra that ourses such as MATH2012, MATH2	can be applied in		
Course Contents & Topics	 Limits; ca Mean va Higher o Radian, Definite a Complex Applicati 	order derivatives; i calculus of trigon and indefinite inte c numbers, polar t ions: Solving simp	ferentiability. ylor's theorem; implicit differentia maxima and minima; graph sket nometric functions. tegrals; integration by substitutior form, de Moivre's formula. hple ordinary differential equations	ching. ns; integration by parts; integration by	partial fractions.		
Course Learning		,	of this course, students should b				
Outcomes	CLO 1 describe properties of functions and inverse functions						
	CLO 2 evaluate limits, and determine continuity and differentiability of functions						
	CLO 3 apply advanced rules/techniques of differentiation and integration to compute derivatives and integrals; sketch graphs of functions; approximation of functions						
	CLO 4 solve problems involving complex numbers						
	CLO 5 solve simple first and second order ordinary differential equations						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	Level 2 or above in Module 1, or Module 2 of HKDSE Mathematics or equivalent, or Pass in MATH1009 or MATH1011; and Not for students who have passed MATH1821, or (MATH1851 and MATH1853), or have already enrolled in this					
Offer in 2020 - 2021	Y 1st	sem 2nd sem	Offer in 2021 - 2022 : Y	Examination	Dec May		
Grade Descriptors (A+ to F)	A	applications through	gh correctly analysing problems, clearly a	and ideas by being able to identify the appropri and elegantly presenting correct logical reason ectly, and with some innovative approaches to	ing and argumentation		

	В	Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theor applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying t theorems or their applications and presentation or with some minor computational errors. Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate the content of the						
	С	Demonstrate an acceptable but with some inadequaci- presentation or a number of						
	D		I ideas by being able to correctly identify appro ugh incorrectly analysing problems with poor arg					
	Fail	Demonstrate poor and inade being able to complete the s		ot being able to identify appropriate theorems or	their applications, or not			
Course Type	Lecture-b	ased course						
Course Teaching	Activities	3	Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials				12			
	Reading / Self study				100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments			10	CLO 1,2,3,4,5			
	Examination			50	CLO 1,2,3,4,5			
	Test			40	CLO 1,2,3,4,5			
Required/recommended reading and	Adrian Ba 2007)	nner: The Calculus Life	saver: All the Tools Y	ou Need to Excel at Calculus (Princet	on University Press,			
online materials	George B	. Thomas, Maurice D. W	eir and Joel Hass: The	omas' Calculus (12th edition, Addison \	Nesley)			
Course Website	http://mod	dle.hku.hk/						
Additional Course	Students	who have passed MATH	11013 are not allowed	to take MATH1009.				
Information	Timetable	:						
			iolabic. 5://hkumath.hku.hk/~math/Timetable/timetable2021_S1.pdf 5://hkumath.hku.hk/~math/Timetable/timetable2021_S2.pdf					

MATH1641	Mathematical laboratory and modeling (6 credits) Academic V				Year 2020		
Offering Department	Mathema	itics		Quota	30		
Course Co-ordinator	TBC, Mathematics ()						
Teachers Involved							
Course Objectives	This course introduces a powerful and free computer software Scilab for scientific research. The programming language will be taught via a number of mathematical models in Physics, Chemistry, Biology, Ecology, Statistics and Management. Some basic and important techniques in Calculus and Linear Algebra will also be covered.						
Course Contents & Topics	Scilab. Elementary mathematical modeling, predator-prey models, epidemic models, host-parasite model etc. Data fitting models and simulation of simple random variable. Random walk models and inventory models. Differentiation and integration of one variable. Elementary linear algebra.						
Course Learning	On succe	essful completion of th	nis course, students should b	e able to:			
Outcomes	CLO 1	recognize the import	ance of numerical methods i	n mathematical modeling			
	CLO 2	demonstrate basic al	lgebraic and arithmetic comp	outations in the Scilab environment	t		
	CLO 3	write and interpret pr	ograms in Scilab programmi	ng language			
	CLO 4	solve simple numerio	cal problems by using interac	ctive Scilab commands			
	CLO 5	solve moderately cor	mplicated numerical problem	s by writing Scilab programs			
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL						
Offer in 2020 - 2021	N Of	fer in 2021 - 2022 : N		Examinatio	n		
Grade Descriptors (A+ to F)	A Demonstrate an excellent understanding of key concepts and Scilab skills by being able to identify the appropriate Scilab environments and their applications through correctly analysing problems, clearly and efficiently presenting correct algorithms and being able to solve numerical problems by writing Scilab programs carefully and correctly, and with some innovative approaches to solving problems.						
	В	Demonstrate a good understanding of key concepts and Scilab skills by being able to identify the appropriate Scilab environments and their applications through correctly analysing problems, but with some minor inadequacies in identifying the appropriate Scilab components or presenting correct algorithms or with some minor programming/computational errors.					
	С	Demonstrate an acceptable understanding of key concepts and Scilab skills by being able to correctly identify appropriate Scilab environments, but with some inadequacies in solving numerical problems with Scilab through incorrectly analysing problems with inappropriate Scilab environments or with a number of minor programming/computational errors.					
	D	environments, but with problems with inappropri	Demonstrate some understanding of key concepts and Scilab skills by being able to correctly identify appropriate Scilab environments, but with substantial inadequacies in solving numerical problems with Scilab through incorrectly analysing problems with inappropriate Scilab environments or with substantial programming/computational errors.				
	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate Scilab environments or their applications, or not being able to complete the solution.						
Course Type	Lecture-b	ased course	·				
Course Teaching	Activitie	s	Details		No. of Hours		
& Learning Activities	Lectures						
-	Tutorials				12		
	Reading	/ Self study			100		
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examina	tion		50	CLO 1,2,3,4,5		
	Test			50	CLO 1,2,3,4,5		
Required/recommended reading and online materials	F. R. Gio	cided by the course ir ordano, M. D. Weir, V o Learning, 2003)		mathematical modeling (Pacific Gr	rove, CA: Brooks/Cole		

Academic Year 2	2020

MATH1821	Mathema	atical methods for	actuarial science I (6 credits)			
Offering Department	Mathemati		•	Quota		
Course Co-ordinator	Dr C W We	ong, Mathematics (cwv	vongab @hku.hk)			
Teachers Involved	(Dr C W W	/ong,Mathematics)				
Course Objectives	backgroun single varia	his course is the first of the two mathematics courses designed to provide actuarial science students with a solid ackground of calculus of one and several variables and an introduction to linear algebra. The course focuses on ingle variable calculus and elementary matrix theory. It aims at students with Core Mathematics plus Module 1 or fore Mathematics plus Module 2 background.				
Course Contents & Topics	- Limits, co - Mean val - Bisection - Higher or - Taylor ap - Improper	Functions; graphs; inverse functions. Limits, continuity and differentiability. Mean value theorem; implicit differentiation; L'Hopital's rule. Bisection method and Newton's method. Higher order derivatives, maxima and minima, graph sketching. Taylor approximation and error estimation. Improper integrals, partial fractions, integration by parts. Numerical integration, Trapezoidal rule and Simpson's rule. Basic matrix and vector (of orders 2 and 3) operations, determinants.				
		itrix and vector (of orde ifferential equations.	rs 2 and 3) operations, determinants	S.		
Course Learning	On succes	sful completion of this	course, students should be able to:			
Outcomes	CLO 1 de	scribe properties of a fo	unction and an inverse function			
	CLO 2 ev	aluate various kinds of	limits, and determine continuity and	differentiability of function	ns	
	cLO 4 ap	etch graphs of function proximate integrals by		gration to compute deriva	atives and integrals;	
			ond order ordinary differential equat	ions		
(and Co-requisites and Impermissible combinations)	Not for stu courses. For BSc(A	Level 4 or above in HKDSE Mathematics plus Module 1, or Level 4 or above in HKDSE Mathematics plus Module 2, or equivalent; and Not for students who have passed MATH1013 or (MATH1851 and MATH1853), or have already enrolled in these courses. For BSc(ActuarSc) students only.				
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2	022 : Y	Examination	n Dec	
Grade Descriptors (A+ to F)	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems. B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.					
	С	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.				
	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.					
	∥Fail	Demonstrate poor and inac		dentify appropriate theorems of	· '	
	Fail	being able to complete the	dequate understanding by not being able to	dentify appropriate theorems o	· '	
	1		dequate understanding by not being able to	dentify appropriate theorems o	· '	
Course Teaching	1	being able to complete the ased course	dequate understanding by not being able to	dentify appropriate theorems o	· '	
Course Type Course Teaching & Learning Activities	Lecture-ba	being able to complete the ased course	dequate understanding by not being able to solution.	dentify appropriate theorems o	or their applications, or not	
Course Teaching	Lecture-ba	being able to complete the ased course	dequate understanding by not being able to solution.	dentify appropriate theorems o	or their applications, or not	
Course Teaching	Lecture-ba Activities Lectures Tutorials	being able to complete the ased course	dequate understanding by not being able to solution.	dentify appropriate theorems o	or their applications, or not No. of Hours 36	
Course Teaching & Learning Activities Assessment Methods	Lecture-ba Activities Lectures Tutorials Reading / Methods	being able to complete the used course Self study	dequate understanding by not being able to solution.	Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping	
Course Teaching & Learning Activities Assessment Methods	Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme	being able to complete the seed course Self study	dequate understanding by not being able to solution. Details	Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6	
Course Teaching & Learning Activities Assessment Methods	Lecture-ba Activities Lectures Tutorials Reading / Methods	being able to complete the seed course Self study	dequate understanding by not being able to solution. Details	Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping	
Course Teaching	Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme	being able to complete the seed course Self study	dequate understanding by not being able to solution. Details	Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6	
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati Test George B. edition)	being able to complete the used course Self study nts on Thomas; as revised	dequate understanding by not being able to solution. Details	Weighting in final course grade (%) 10 50 40	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6	
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati Test George B. edition)	being able to complete the ised course Self study nts on	dequate understanding by not being able to solution. Details Details	Weighting in final course grade (%) 10 50 40	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6	
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati Test George B. edition) http://mood	being able to complete the ised course Self study nts on Thomas; as revised	dequate understanding by not being able to solution. Details Details	Weighting in final course grade (%) 10 50 40	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6	

MATH1851	Calculus and ordinary differential equations (6 credits)	Academic Year	2020		
Offering Department	Mathematics	Quota	700		
Course Co-ordinator	Prof Y K Lau (1st sem); Dr X Zhang (2nd sem), Mathematics (yklau@maths.hl	ku.hk; xzhang@mat	hs.hku.hk)		
Teachers Involved	(Dr L Xu,Mechanical Engineering) (Dr X Zhang,Mathematics) (Dr Y Chen,Mechanical Engineering) (Prof K W Chow,Mechanical Engineering) (Prof Y K Lau,Mathematics)				
Course Objectives	In this course, students will be introduced to fundamental concepts of calculus and ordinary differential equations with a view on applications in different engineering fields. A concrete foundation of mathematics that underpins the various engineering subjects will be built. Mathematical concepts and principles, as well as some typical engineering applications, would be emphasized so that students could enhance their mathematical skills in solving engineering problems, and be well prepared in learning a higher level of applied mathematics required in different engineering disciplines.				
Course Contents & Topics	 Differential and integral calculus (single variable) [limits and continuity, deri- elementary functions, derivatives by implicit differentiation, the mean value the representation of curves, polar coordinates, indefinite integrals, integrals, decomposition, definite integrals, the fundamental theorem of calculus, and the 	eorem, L'H\^{o}pital' ration by parts, p	s rule, parametric		

Course Learning Outcomes	separable equations of paramet physical in - Laplace derivatives fractions, s On succes CLO 1 de	dinary differential equations [first order equations, integrating factors and linear equations, Bernoulli equations departs equations, homogeneous equations, exact differential equations, higher-order homogeneous actions with constant coefficients, characteristic polynomials, methods of undetermined coefficients and variameters, higher-order inhomogeneous linear ordinary differential equations, choice of particular solution sical implication of resonance, Cauchy-Euler equations, and their applications] eplace transforms [Laplace transforms of elementary functions, inverse Laplace transforms, transformatives and integrals, derivatives of Laplace transform, first and second shifting theorems, convolutions, sicions, solution of linear differential equations (initial value problems) using Laplace transforms] successful completion of this course, students should be able to: 1 demonstrate knowledge and understanding of basic calculus and ordinary differential equations as we their relationship with some typical physical/engineering applications: unerringly perform the calcudetails for the solution, and accurately correlate the solution approach with the fundamental continvolved			
	CLO 3 un po res CLO 4 ex vib	rolved ply mathematical skills to blem, identify the appred, clearly give the mathematical applications in ersonance where large amplore the technique anample. Appreciate the rations and signal processively prepared to cope well prepared to cope of the processive skills.	o model and solve some basic physic priate mathematical skills, articulatematical formulation, and correctly led methods to solve differential nighteering topics like oscillations are uplitude displacements can be expedid usage of integral transform, usin power of these techniques in in	sical/engineering problem ate a convincing rational find the solution equations, and correlate and electric circuits. Identificted ing the Laplace transforr itial value problems an	s: analyze the given e for the approach e qualitatively with y the occurrence of m as an illustrative d applications like
Pre-requisites (and Co-requisites and Impermissible combinations)	Level 2 or Pass in MA	disciplines evel 2 or above in Module 1, or Module 2 of HKDSE Mathematics or equivalent, or ass in MATH1011. This course is exclusively for Engineering students.)			
Offer in 2020 - 2021	Y 1st	sem 2nd sem Offer i	n 2021 - 2022 : Y	Examination	Dec May
(A+ to F)	B C D	and their applications through correctly analysing problems, but with some minor inadequacies in arguments, ident appropriate theorems and methods or their applications and presentation or with some minor computational errors. Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate and methods, but with some inadequacies in applying them through incorrectly analysing problems with poor argu presentation or a number of minor computational errors. Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorem methods, but with substantial inadequacies in applying them through incorrectly analysing problems with poor arguments, but with substantial computational errors.			e theorems and methods guments, identifying the mal errors. ify appropriate theorems with poor argument and propriate theorems and is with poor argument or
Course Type		ised course			
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures				36
	Tutorials	Salf study			12 100
Accoccment Matheda	-	Self study	Details	Majabtica in fin-1	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignme	nts		10	CLO 1,2,3,4,5
	Examinati	on		70	CLO 1,2,3,4,5
	Test		2 tests	20	CLO 1,2,3,4,5
Required/recommended reading and online materials	G.B. Thom R.K. Nagle 2008, 5th	(Textbook) Introduction to Calculus and Differential Equations (Pearson) G.B. Thomas, et al.: Thomas' Calculus (Pearson Education, 2005, 11th ed.) R.K. Nagle, et al.: Fundamentals of Differential Equations and Boundary Value Problems (Pearson E 2008, 5th ed.)			Pearson Education,
Course Website		dle.hku.hk/			
Additional Course Information	Students a This cours Timetable: http://hkum	re advised not to take Ne is offered by the Depanath.hku.hk/~math/Time	ssed test or assignment under norm IATH1851 and MATH1853 together introduced from the fact table/timetable2021_S1.pdf table/timetable2021_S2.pdf	in the same semester.	

MATH1853	Linear algebra, probability and statistics (6 credits)	Academic Year	2020		
Offering Department	Mathematics	Quota	700		
Course Co-ordinator	Prof G Han, Mathematics (ghan @maths.hku.hk)				
Teachers Involved	(Dr N Wong, Electrical & Electronic Engineering) (Prof G Han, Mathematics) (Prof S H Lo, Civil Engineering) (Prof Z Q Yue, Civil Engineering)				
Course Objectives	As the complementary course of MATH1851, students will be introduced to more topics of mathematics commonly applied in engineering so that students could be further enhanced with a concrete skill in mathematics underpinned for different engineering subjects. The course emphasizes mathematical concepts, principles, analysis, and their relationship to the modelling of engineering systems. Students could be furnished with the essential mathematical skills to analytically tackle some typical engineering problems to prepare for all the engineering subjects.				
Course Contents & Topics	 Linear algebra [vectors and scalars, inner product, vector projection, matrix, determinant, matrix inverse, system of linear equations, matrix e rule, matrix rank, eigenvalue, eigenvector, matrix diagonalization, positi their applications] 	equation, Gaussian elim	ination, Cramer's		

Course Learning Outcomes	Moivre's the Basic proformula, rapplication - Common Normal disense standard for application On success CLO 1 destandard for standard f	Elementary complex variables [arithmetics of complex numbers, representations of complex numbers, De loivre's theorem, roots of unity, complex functions, and their applications] Basic probability theory [axioms of probability, conditional probability, Bayes' theorem, the total probability ormula, random variable, (joint) probability distribution, expectation, variance, independence, and their pplications] Commonly used distributions [Bernoulli, Binomial, Geometric, Negative Binomial, Exponential, Poisson and lormal distribution, and their applications] Basic statistics [point estimates, sample mean, sample variance with known or unknown mean, confidence terval for a population mean with known or unknown population variances, inference for proportion, and their pplications] In successful completion of this course, students should be able to: CLO 1 demonstrate knowledge and understanding of linear algebra, complex numbers, probability theory and statistics as well as their relationship with some typical physical/engineering applications: unerringly perform the calculation details for the solution, and accurately correlate the solution approach with the fundamental concepts involved CLO 2 apply such knowledge and understanding to solve certain practical problems that are relevant to physical/engineering applications: analyze the given problem, identify the appropriate mathematical skills, articulate a convincing rationale for the approach used, and clearly give the mathematical formulation, and correctly find the solution be well prepared to cope with a higher level of engineering mathematics required in different engineering			
			with a higher level of engineering	ng mathematics required in o	different engineering
Pre-requisites (and Co-requisites and Impermissible combinations)	Level 2 or	disciplines evel 2 or above in Module 1, or Module 2 of HKDSE Mathematics or equivalent, or Pass in MATH1011, or take MATH1011 and MATH1853 concurrently in the same semester. (This course is exclusively for Engineering tudents.)			
Offer in 2020 - 2021	Y 1st	sem 2nd sem Offer	in 2021 - 2022 : Y	Examination	Dec May
Grade Descriptors (A+ to F)	Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and methods and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.				
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and methods and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems and methods or their applications and presentation or with some minor computational errors. C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems and methods, but with some inadequacies in applying them through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.				
	D Fail	Demonstrate some underst methods, but with substant presentation or with substan	tanding of key concepts and ideas by tial inadequacies in applying them thro tial computational errors. dequate understanding by not being a	ough incorrectly analysing problems	with poor argument or
Course Type	Lecture-ba	sed course	·		
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures				36
	Tutorials				12
	Reading /	Self study			100
Assessment Methods and Weighting	Methods	·	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignme	nts		20	CLO 1,2,3
	Examinati	on		80	CLO 1,2,3
Required/recommended reading and online materials	D.C. Lay: Linear Algebra and its Applications (Addison-Wesley, 2012, 4th ed.) S.J. Leon: Linear Algebra with Applications (Pearson Education, 2006, 7th ed.) G. James, et al.: Modern Engineering Mathematics (Pearson Education, 2008, 4th ed.) C. Rorres and H. Anton: Applications of Linear Algebra (Wiley, 1984, 3rd ed.) E. Kreyzig: Advanced Engineering Mathematics (Wiley, 2006, 9th ed.)				
Course Website	http://mood				
Additional Course Information	Students a This cours Timetable: http://hkun	re advised not to take Ne is offered by the Depa nath.hku.hk/~math/Time	issed quiz or assignment under MATH1851 and MATH1853 toge artment of Mathematics and the letable/timetable2021_S1.pdf etable/timetable2021_S2.pdf	ther in the same semester.	

MATH2012	Fundamental concepts of mathematics (6 credits)	Academic Year	2020
Offering Department	Mathematics	Quota	
Course Co-ordinator	Dr Y M Chan, Mathematics (ymchan@maths.hku.hk)		
Teachers Involved	(Dr Y M Chan, Mathematics)		
Course Objectives	To provide students with solid background on fundamental concepts of mather proofs. Such concepts and methods are important for subsequent studenth mathematics. This course can be taken concurrently with other Level 2 or about 100 per concurrently with other Level 2 or about 100 per concurrently with other Level 2 or about 100 per concurrently with other Level 2 or about 100 per concurrently with other Level 2 or about 100 per concurrently with other Level 2 or about 100 per concurrently with 100 per concurrent with 100 per concurrent wit	lies in all higher I	
Course Contents & Topics	 Elementary set theory. Statement calculus. Mathematical proofs. Relations and functions. Finite and infinite sets. Natural numbers and mathematical induction. Real numbers and the limits of sequences. Examples of groups. 		
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 understand the definition of a set and apply set theory in simple daily CLO 2 construct the truth table of a given statement CLO 3 apply different proof strategies (e.g. proof by contradiction and m	'	on) in proving a

	CLO 4 de	emonstrate the basic	properties of equivalence relations			
			ion of limits of sequences of real num	bers		
		•	ational properties of groups			
Pre-requisites (and Co-requisites and Impermissible combinations)	Students have stro	ass in MATH1013 or MATH1821 or (MATH1851 and MATH1853). Rudents with good grades in HKDSE Math Module 1 or Math Module 2 (or other equivalent qualifications) and ave strong interests in math may also apply for taking this course concurrently with its prerequisites courses ubject to the approval from Course Selection Advisors).				
Offer in 2020 - 2021	Y 1st	1st sem 2nd sem Offer in 2021 - 2022 : Y Examination				у
Grade Descriptors (A+ to F)	A	applications through co and being able to carry	ent understanding of key concepts and ideas lorrectly analysing problems, clearly and elegar of out computations carefully and correctly, and	ntly presenting correct logical reas with some innovative approaches t	oning and argume to solving problems	entation ıs.
	В	applications through co	understanding of key concepts and ideas by orrectly analysing problems, but with some mi cations and presentation or with some minor co	inor inadequacies in arguments, id omputational errors.	dentifying the appr	ropriate
	С	but with some inaded	otable understanding of key concepts and idea quacies in applying the theorems through i per of minor computational errors.			
	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.					
	Fail	being able to complete	inadequate understanding by not being able the solution.	to identify appropriate theorems or	their applications,	, or not
Course Type	-	ased course				
Course Teaching	Activities	S	Details		No. of Hou	urs
& Learning Activities	Lectures				36	
	Tutorials					
-					12	
	Reading	/ Self study			100	
		<u> </u>	Details	Weighting in final course grade (%)		ds
	Reading	,	Details Tutorials and Assignments		100 Assessme Method	ds pping
	Reading / Methods	ents		course grade (%)	Assessme Method to CLO Mar	ds pping ,4,5,6
	Reading Assignment	ents		course grade (%)	Assessme Method to CLO Mar CLO 1,2,3,4	ds pping ,4,5,6 ,4,5,6
and Weighting Required/recommended reading and	Reading American Methods Assignment Examinat Test Gary Char	ents tion	Tutorials and Assignments olimeni, Ping Zhang: Mathematical F	10 50 40	Assessme Method to CLO Mar CLO 1,2,3,4 CLO 1,2,3,4 CLO 1,2,3,4	ds pping ,4,5,6 ,4,5,6 ,4,5,6
Assessment Methods and Weighting Required/recommended reading and online materials Course Website	Reading of Methods Assignment Examinat Test Gary Charles (Pearson,	ents tion artrand, Albert D. Po	Tutorials and Assignments olimeni, Ping Zhang: Mathematical F	10 50 40	Assessme Method to CLO Mar CLO 1,2,3,4 CLO 1,2,3,4 CLO 1,2,3,4	ds pping ,4,5,6 ,4,5,6 ,4,5,6

MATH2014	Multiva	riable calculus and linear algebra (6 credits)	Academic Year	2020			
Offering Department	Mathema	atics	Quota				
Course Co-ordinator	Dr H Y Z	Dr H Y Zhang, Mathematics (hyzhang@maths.hku.hk)					
Teachers Involved	(Dr H Y Z	Zhang,Mathematics)					
Course Objectives		le students with a solid foundation in calculus of several variable dy of mathematics related subjects.	es and linear algebra, wh	nich they will need			
Course Contents & Topics	interpreta - Partial - Partial - Taylor's f - Multiple - Matrix A - Vector basis and - Eigenva - Numeri Trapezoi	 Vectors and Matrices: Vectors in space, dot product and cross product, determinants (with geometric interpretations). Partial Derivatives: Functions of several variables, partial derivatives, extreme values and Lagrange multipliers, Taylor's formula. Multiple Integrals: Double and triple integrals, substitution in multiple integrals. Matrix Algebra: Matrix addition and multiplication, system of linear equations as a matrix equation. Vector Spaces: The Euclidean spaces as vector spaces, its subspaces, span of vectors, linear independence, basis and dimension. Eigenvalues and Eigenvectors: Diagonalization and computing powers. Numerical Methods: Bisection method and Newton's method for finding roots of equations, Simpson's rule and Trapezoidal rule for numerical integration. 					
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 understand the geometric meaning of partial and directional derivatives CLO 2 optimize multivariate objective functions (with/without constraints) CLO 3 evaluate integrals over curvilinear regions in space CLO 4 understand the concept of vector spaces, basis, dimension						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in N Not for s	CLO 5 solve simple eigenvalue problems and apply the theory to practical problems Pass in MATH1013 or (MATH1851 and MATH1853). Not for students who have passed MATH2822 or [(MATH2101 or MATH2102) and MATH2211], or have already enrolled in these courses.					
Offer in 2020 - 2021	Y 1s	t sem 2nd sem Offer in 2021 - 2022 : Y	Examination	Dec May			
Grade Descriptors (A+ to F)	A	Demonstrate an excellent understanding of key concepts and ideas by being applications through correctly analyzing problems, clearly and elegantly pres and being able to carry out computations carefully and correctly, and with sor	senting correct logical reasoning me innovative approaches to so	ng and argumentation olving problems.			
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analyzing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.						
	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analyzing problems with poor argument and presentation or a number of minor computational errors.						
	D	Demonstrate some understanding of key concepts and ideas by being able substantial inadequacies in applying the theorems through incorrectly analyz with substantial computational errors.					
	Fail	Demonstrate poor and inadequate understanding by not being able to identibeing able to complete the solution.	ify appropriate theorems or the	eir applications, or not			

Course Type	Lecture-based course			
Course Teaching	Activities	Details		No. of Hours
& Learning Activities	Lectures			36
	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Examination		50	CLO 1,2,3,4,5
	Test		50	CLO 1,2,3,4,5
Required/recommended reading and online materials	TBC			
Course Website	http://moodle.hku.hk/			
Additional Course Information		:h/Timetable/timetable2021_S1.pd :h/Timetable/timetable2021_S2.pd		

MATH2101	Linear a	Igebra I (6 credits)		Academic Ye	ar 2020	
Offering Department	Mathemat			Quota		
Course Co-ordinator		Law (1st & 2nd s @maths.hku.hk)	sem); Dr T W Ching (1st sem),	Mathematics (lawkaho	@connect.hku.hk;	
Teachers Involved	(Dr K H La	aw,Mathematics)				
Course Objectives	This is a f	This is a first university level course on linear algebra, which aims at introducing to students the basic concept of near structure through many concrete examples in the Euclidean spaces. The course also enriches students' exposure to mathematical rigor and prepares them for studying more advanced mathematical courses.				
Course Contents & Topics	- Matrix A equations - Systems elementar - Vector Syectors, lir - Linear T linear tran	Matrix Algebra: Matrix addition and multiplication, determinant and inverse of square matrices, system of linear equations as a matrix equations: Gauss-Jordan elimination, elementary row operations, row echelon form, elementary matrices, matrix inversion. Vector Spaces: Coordinate system in R^n, the Euclidean spaces as vector spaces, its subspaces, span of vectors, linear independence, basis, dimension, applications. Linear Transformations: Definition and examples of linear transformations in R^2 and R^3, standard matrices of inear transformations. Eigenvalue Problem: Eigenvalues and eigenvectors, diagonalization of matrices, applications.				
	- Inner Pro	oduct: Gram-Schmidt p	rocess, least square problems.			
Course Learning			course, students should be able to:			
Outcomes	CLO 2 so	olve systems of linear atrices	and use them in some practical proble equations by Gauss-Jordan eliminat of vector spaces, basis, dimension, a	ion and also compute	·	
			f some linear transformations	o some practical problem		
	CLO 4 solve some simple eigenvalue problems and apply the theory to some practical problems CLO 5 solve some practical problems involving the least square concept					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	Pass in MATH1013 or MATH1821 or (MATH1851 and MATH1853)				
Offer in 2020 - 2021	Y 1st	sem 2nd sem Offe	r in 2021 - 2022 : Y	Examination	Dec May	
Grade Descriptors (A+ to F)	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.					
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.					
	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.					
	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.					
	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.					
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading /	Self study	Students are expected to watch videos online before classes.		100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignments		Continuous assessment (assignments, tests, participation, etc.)	50	CLO 1,2,3,4,5	
	Examinat	ion		50	CLO 1,2,3,4,5	
Required/recommended reading and online materials	Spence, Ir	nsel & Friedberg: Elem	entary Linear Algebra A Matrix Appr	oach (Pearson, 2014)		
Course Website	http://moo	dle.hku.hk/				
Additional Course	Timetable					

MATH2102	Linear a	Igebra II (6 credits)		Academic Yo	ear 2020	
Offering Department	Mathemat	iics		Quota		
Course Co-ordinator		hing, Mathematics <i>(Imto</i>	ching @maths.hku.hk)			
Teachers Involved		Ching,Mathematics)				
Course Objectives	subspaces students'	nis is a follow-up of the course Linear Algebra I. It aims at introducing the general concept of vector spaces, ibspaces, dimensions, inner product spaces, etc. The course prepares the foundation on linear algebra for udents' future study in mathematics and other disciplines. Many examples of applications will be drawn on ferent subject areas.				
Course Contents & Topics	2. Linear determina 3. Linear diagonaliz 4. Inner pr 5. Linear diagonaliz 6. Addition	Vector spaces: definition of field, subspaces/quotient spaces, direct sum, existence of basis, dual space Linear transformations: kernel and image, isomorphisms, matrix representations of linear transformations, eterminant Linear operator: eigenvalues and eigenspaces, algebraic/geometric multiplicity, agonalizability, Cayley-Hamilton theorem, canonical form Inner product space: Inner product, orthonormal basis, orthogonal complement and projection Linear operators on inner product space: adjoints of operators, orthogonal/unitary operators, orthogonal/unitary agonalization of self-adjoint/normal operators, symmetric bilinear form and quadratic form Additional selected topics up to the instructor				
Course Learning	On succes	ssful completion of this	course, students should	be able to:		
Outcomes				t knowledge to some practical proble	ms	
			subspaces and compute			
				sformations/operators. Relate the ca	alculations of linear	
			matrices by choosing pa			
				erators and apply it to the problem of		
				and adjoints of operators. Be abl	e to do calculation	
		volving properties of adj	•			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M.	IATH2101 or (MATH182	21 and MATH2822)			
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	2022 : Y	Examination	May	
Grade Descriptors	Α			and ideas by being able to identify the appro	,	
(A+ to F)	applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems. B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate					
	theorems or their applications and presentation or with some minor computational errors. C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and					
	presentation or a number of minor computational errors.					
	D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.					
	Fail			being able to identify appropriate theorems o	r their applications, or not	
Course Type	Locture	being able to complete the ased course	SOIUIION.			
• • • • • • • • • • • • • • • • • • • •			Deteile		No of House	
Course Teaching & Learning Activities	Activities Lectures	•	Details		No. of Hours 36	
a Learning Activities	Tutorials				12	
		/ Self study			100	
Assessment Methods		/ Self study	Deteile	Maintain a in C	-	
and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents		10	CLO 1,2,3,4,5	
	Examination			50	CLO 1,2,3,4,5	
	Test			40	CLO 1,2,3,4,5	
	S. Friedbe	erg, A. Insel, L. Spence:	Linear algebra (Pearso	n, 4th edition)		
reading and						
reading and online materials		dle.hku.hk/	<u> </u>	·		
Required/recommended reading and online materials Course Website Additional Course		odle.hku.hk/				

MATH2211	Multivariable calculus (6 credits)	Academic Year	2020				
Offering Department	Mathematics	Quota					
Course Co-ordinator	Dr T W Ching, Mathematics (Imtching@maths.hku.hk)						
Teachers Involved	(Dr T W Ching, Mathematics)						
Course Objectives	Students of this course will learn the theory of multivariable calculus and learn how to apply the theory to solve practical problems. This is a required course for Mathematics and Mathematics/Physics Majors, and is suitable for all students in Science, Engineering, Economics and Finance, and other students who will use multivariable calculus in their areas of study. This is also a required course for all Minors offered by the Department of Mathematics, and is a pre-requisite of many advanced level mathematics courses.						
Course Contents & Topics	 Vectors: vectors in 2-, 3-, and n-dimensions; dot product and cross product; lines and planes; polar, cylindrical and spherical coordinates. Differentiation in several variables: limits and derivatives; the chain rule; directional derivatives and gradients. Vector-valued functions: parametrized curves; arc-length; vector fields; gradient, divergence, curl, and the de operator. Maxima and minima: differentials and Taylor's Theorem of several variables; extrema of functions; Lagrange multipliers; applications of extrema. 						

	- Multiple integration: double and triple integrals; change of variables; applications Line integrals: scalar and vector line integrals; Green's Theorem; conservative vector fields Surface integrals and vector analysis: parametrized surfaces; surface integrals; Stokes' and Gauss' Theorems.						
Course Learning	On successful completion of this course, students should be able to:						
Outcomes				calculus of functions in several real va	riables		
	CLO 2 ev	valuate partial deriva	atives and multiple integrals	s; compute line integrals and surface ir	itegrals		
				roblems, such as constrained optimiz	ation problems and		
	of	ther problems involv	ing differentiation and integ	gration of multivariable functions			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	IATH1013 or MATH	1821 or (MATH1851 and N	MATH1853)			
Offer in 2020 - 2021	Y 1st	sem 2nd sem C	Offer in 2021 - 2022 : Y	Examination	Dec May		
Grade Descriptors (A+ to F)	A	applications through c	orrectly analysing problems, clea	ots and ideas by being able to identify the appro rly and elegantly presenting correct logical reas correctly, and with some innovative approaches	oning and argumentation		
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.						
	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theo but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument presentation or a number of minor computational errors.						
	D	priate theorems, but with jument or presentation or					
	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.						
Course Type	Locturo h	ased course	the solution.				
Course Teaching	Activitie:		Details		No. of Hours		
& Learning Activities	Lectures	*	Details		36		
3	Tutorials				12		
		/ Self study			100		
Assessment Methods and Weighting	Methods	,	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents		10	CLO 1,2,3		
	Examination			50	CLO 1,2,3		
	Test			40	CLO 1,2,3		
Required/recommended reading and online materials	Susan J.	Susan J. Colley: Vector Calculus (Pearson, 2011, 4th edition)					
Course Website	http://moodle.hku.hk/						
Additional Course Information	Students are assumed to have mastered calculus of one-variable prior to taking this course. Timetable: http://hkumath.hku.hk/~math/Timetable/timetable/2021_S1.pdf http://hkumath.hku.hk/~math/Timetable/timetable/2021_S2.pdf						

MATH2241	Introduc	ction to mathematical analysis (6 credits)	Academic Year	2020			
Offering Department	Mathemat	tics	Quota				
Course Co-ordinator	Dr T W Ching (1st sem); Dr Y M Chan (2nd sem), Mathematics (Imtching @maths.hku.hk; ymchan @maths.hku.hk)						
Teachers Involved		Ching,Mathematics) Chan,Mathematics)					
Course Objectives	To introdu	ice students to the basic ideas and techniques of mathemati	ical analysis.				
Course Contents & Topics	 The real number system: the real numbers as an ordered field, supremum and infimum, the completeness axiom denseness of the rational numbers. Sequences and series of real numbers: limits of sequences, properties of convergent sequences, monotone sequences and Cauchy sequences, subsequences, series, tests of convergence for series. Continuity of real-valued functions: properties of continuous functions, the extreme value theorem, the intermediate value theorem, uniform continuity, limits of functions. Differentiation: properties of differentiable functions, the mean value theorem, Taylor's theorem and its applications. Integration: construction of the Riemann integral using Darboux sums and Riemann sums, the fundamenta theorem of calculus. 						
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 comprehend and use abstract mathematical arguments such as the epsilon-delta argument CLO 2 demonstrate convergence or non-convergence of a sequence/series using properties of converge sequences/series CLO 3 elucidate important properties of continuous functions such as the extreme value theorem and the intermediate value theorem CLO 4 elucidate important properties of differentiable functions such as the mean value theorem, and understand and apply Taylor's Theorem CLO 5 articulate the construction of the Riemann integral and its relation to differentiation						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in MATH1013 or (MATH1851 and MATH1853) or MATH2822. Students are strongly recommended to have taken MATH2012 if they wish to take this course.						
Offer in 2020 - 2021	Y 1st	sem 2nd sem Offer in 2021 - 2022 : Y	Examination	Dec May			
Grade Descriptors (A+ to F)	A	Demonstrate a thorough mastery of the mathematical notions and proof abstract mathematical arguments, to apply appropriate theorems correct situations. Ability to present solutions clearly and logically, and the use o	ctly, and to make use of those prod	f techniques in novel			
	В	Demonstrate a substantial command of the mathematical notions and handle abstract mathematical arguments, to apply appropriate theorem proof techniques in novel situations. Ability to present solutions clearly a	ns correctly, and, with guidance, to	make use of those			

		problems are expected.						
	С		strate a good understanding of the mathematical notions and proof techniques taught in the course by abstract mathematical arguments and to apply appropriate theorems correctly. Ability to present solution					
	D	Demonstrate some understanding of the mathematical notions taught in the course by being able to correctly identify appropriate theorems for applications and to carry out logical arguments that are leading to complete solutions.						
	Fail		Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems for application able to apply the theorems correctly.					
Course Type	Lecture-b	pased course						
Course Teaching	Activitie	s	Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials				12			
	Reading / Self study				100			
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignm	ents	Tutorials and Assignments	10	CLO 1,2,3,4,5			
	Examina	ition		50	CLO 1,2,3,4,5			
	Test			40	CLO 1,2,3,4,5			
Required/recommended reading and online materials	Robert G. Bartle, Donald R. Sherbert: Introduction to Real Analysis (Wiley, 2011, Fourth Edition) Kenneth A. Ross: Elementary Analysis: The Theory of Calculus (Springer, 2013, Second Edition)							
Course Website	http://mo	odle.hku.hk/						
Additional Course Information	Timetable: http://hkumath.hku.hk/~math/Timetable/timetable2021_S1.pdf http://hkumath.hku.hk/~math/Timetable/timetable2021_S2.pdf							

MATH2822	Mathem	natical methods for a	actuarial science II (6 credits)	Academic Y	ear 2020		
Offering Department	Mathema						
Course Co-ordinator	Dr T W C	Ching, Mathematics (Imto	hing @maths.hku.hk)				
Teachers Involved	(Dr T W (Ching, Mathematics)	<u> </u>				
Course Objectives	This course is the second of the two mathematics courses designed to provide actuarial science students with a solid background of calculus of one and several variables and an introduction to linear algebra. The course focuse on multivariable calculus and linear algebra. It aims at students with MATH1821. It can be followed by other 2000 or 3000 level mathematics courses.						
Course Contents & Topics	 - Matrices, systems of linear equations, determinants. - Eigenvalues and eigenvectors, diagonalization of matrices. - Quadratic functions and their standard forms. - Vector spaces and subspaces. - Functions of several variables; partial differentiation. - Gradients and directional derivatives. - Taylor approximation, Newton's method. - Maxima and minima; Lagrange multipliers. - Double and triple integrals, areas and volumes. 						
Course Learning	On succe	essful completion of this of	course, students should be able to:				
Outcomes	CLO 1 understand and recognize various topics in linear algebra such as the basic arithmetic of matrices determinants, systems of linear equations, eigenvalues and eigenvectors, diagonalizable matrices, bas and dimension, and the rank-nullity theorem CLO 2 understand and recognize various topics in functions of several variables including partial differentiation the Hessian test for local extrema, vector-valued functions, Jacobians, the method of Lagrange multiplier double/triple integrals and the change of variable formula						
Pre-requisites			The change of variable formula				
(and Co-requisites and Impermissible combinations)	Pass in MATH1821. For BSc(ActuarSc) students only.						
Offer in 2020 - 2021	Y 2n	d sem Offer in 2021 - 2	2022 : Y	Examination	May		
Grade Descriptors (A+ to F)	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.						
	В	Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.					
	С	but with some inadequact presentation or a number of	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.				
	D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.						
	Fail	Demonstrate poor and inad being able to complete the	lequate understanding by not being able to	identify appropriate theorems o	r their applications, or not		
Course Type	Lecture-h	pased course	Jointion.				
Course Teaching	Activitie		Details		No. of Hours		
& Learning Activities	Lectures		Stano		36		
	Tutorials				12		
	Reading / Self study				100		
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm	ents		10	CLO 1,2		
	Examination			50	CLO 1,2		
			Table 1				
	Test		2 tests	40	CLO 1,2		

online materials	Keith Matthews: Elementary Linear Algebra (Url: www.numbertheory.org/book/)
Course Website	http://moodle.hku.hk/
Additional Course	Timetable:
Information	http://hkumath.hku.hk/~math/Timetable/timetable2021_S2.pdf

MATH3001	Develo	pment of mathemati	cal ideas (6 credits)	Academic Ye	ear 2020		
Offering Department	Mathema	atics	•	Quota			
Course Co-ordinator	TBC, Ma	TBC, Mathematics ()					
Teachers Involved							
Course Objectives	a deeper	To acquaint the students with the origin and growth of basic mathematical concepts. To assist the students to gain a deeper insight and broader view of mathematics as a discipline and human endeavour. To provide the students with an opportunity to write on and talk about mathematics, and to engage in independent study.					
Course Contents & Topics	students	- Selected topics in the development of mathematics from ancient to modern times depending on interest of the students and the lecturer, with attention paid to the evolvement of mathematical ideas and the process of mathematical thinking and problem solving.					
Course Learning	On succe	essful completion of this	course, students should be abl	e to:			
Outcomes	CLO 1 L	inderstand and describe	the origin and development of	basic mathematical concepts			
			ate the intellectual and the soc academic discipline and a hum		atics, and appreciate		
			about the development of various		d ideas		
			tudy on a topic about the histor	•			
Pre-requisites			MATH2211 and MATH2241	,			
(and Co-requisites and Impermissible combinations)	1 435 1111	W (1112101, W) (1112102,	IVIVITIEZ IT GIIG IVIVITIEZ T				
Offer in 2020 - 2021	N O	fer in 2021 - 2022 : N		Examination			
Grade Descriptors	Α		sp of the subject. Show strong analy				
(A+ to F)		original thought. Critical use of information from sources to draw appropriate and insightful conclusions. Actively engage in and contribute substantially and fruitfully to class discussions. Apply highly effective organizational and presentational skills.					
	В	B Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Correct use of information from sources to draw appropriate conclusions. Good participation in class discussions with generally good contributions. Apply effective organizational and presentational skills.					
	С	C Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Mostly correct but some erroneous use of information from sources to draw appropriate conclusions. Make some but not					
	substantial fruitful contributions to class discussions. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Limited ability to use information from sources to draw appropriate conclusions. Contribute only in a limited way to fruitful and meaningful class discussions. Apply limited or barely effective organizational and presentational skills.						
	Fail	Demonstrate evidence of analytical and critical abil	little or no grasp of the knowledge a ities, logical and coherent thinking. lake little or no meaningful contributio	Misuse of information from sources	and/or unable to draw		
Course Type	Lecture-l	pased course					
Course Teaching	Activitie	es .	Details		No. of Hours		
& Learning Activities	Lectures	3			36		
	Tutorials	;			12		
	Reading	/ Self study			100		
Assessment Methods and Weighting	Method	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examina	ation		50			
	Test 50						
	Test			50			

MATH3002	Mathematics seminar (6 credits)	Academic Year	2020				
Offering Department	Mathematics Quota 12						
Course Co-ordinator	Prof T W Ng; Dr Y M Chan, Mathematics (ntw@maths.hku.hk; ymchan@maths.hku.hk)						
Teachers Involved	(Dr Y M Chan,Mathematics) (Prof T W Ng,Mathematics)						
Course Objectives	This is a seminar style course intended for those who have very strong interests and good ability in mathematics. Students will be given book chapters and elementary research articles for private study and then make presentations in front of the whole class. Individual meetings with the instructors will be arranged prior to their presentations. Active participation in all the discussions is expected. The aim of the course is to let students learn how to initiate self/independent study in mathematics.						
Course Contents & Topics	Topics chosen by the instructors, including chapters from books and elementary research articles.						
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 Initiate private independent study on some interesting mathematical topics						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in MATH2012, MATH2101, MATH2211 and MATH2241 Subject to approval by the Department.						
Offer in 2020 - 2021	Y 2nd sem Offer in 2021 - 2022 : Y	Examination	No Exam				

Grade Descriptors (A+ to F)	A		y engage in and contribute su	g analytical and critical abilities and logical the bstantially and fruitfully to class discussions		
	В	Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Good participation in class discussions with generally good contributions. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Make some but not substantial fruitful contributions to class discussions. Apply moderately effective organizational and presentational skills.				
	D	logical thinking, but with		me relevant information, of the subject. Eviden ilities. Contribute only in a limited way to fruit al and presentational skills.		
	Fail	Demonstrate evidence of analytical and critical ab	of little or no grasp of the know	rledge and understanding of the subject. Evid king. Make little or no meaningful contributio		
Course Type	Project-l	pased course				
Course Teaching	Activities		Details	Details		
& Learning Activities	Meeting with supervisor		meeting of the whole teaching week	36		
	Reading / Self study		individual meetings with the instructors		72	
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Oral pre	esentation		50	CLO 1	
	Researc	ch report		50	CLO 1	
Course Website	http://mo	oodle.hku.hk/				
Additional Course Information	(ií) This Timetab	course is not a capstond le:	· ·	course are recommended to take MA 2.pdf	TH4910.	

MATH3301	Algebr	a I (6 credits)		Academic Ye	ear 2020	
Offering Department	Mathem	atics		Quota		
Course Co-ordinator	Prof Y K	Lau, Mathematics	(yklau@maths.hku.hk)			
Teachers Involved	(Prof Y k	K Lau, Mathematics)				
Course Objectives	in mathe	ematics and the app	those fundamental topics and technique lied sciences. It is complete in itself, and Applied Discrete Mathematics.			
Course Contents	- Groups	s: examples of grou	ps, subgroups, cosets, Lagrange theore	em, quotient groups, norm	al subgroups, group	
& Topics	homomorphisms, direct product of groups, group actions. - Rings: examples of rings, integral domains, ideals, fields of fractions, principal ideal domains, unique factorization domains. - Fields: definition and examples of fields. - Polynomials: polynomial rings in one variable over fields and over the integers.					
Course Learning	On succ	essful completion of	this course, students should be able to:			
Outcomes	CLO 1	write down the pre	ecise definitions of the basic concepts in	the "Course Contents"		
	CLO 2		each of the concepts in the "Course Con	ntents"		
	CLO 3	understand basic	properties of groups, rings, and fields			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	MATH2101				
Offer in 2020 - 2021	Y 19	st sem Offer in 202	21 - 2022 : Y	Examination	Dec	
Grade Descriptors (A+ to F)	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.					
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.					
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.					
	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.					
	Fail	Demonstrate poor a being able to comple	nd inadequate understanding by not being able to te the solution.	identify appropriate theorems or	their applications, or no	
Course Type	Lecture-	based course				
Course Teaching	Activiti	es	Details		No. of Hours	
& Learning Activities	Lecture	S			36	
	Tutorial	S			12	
	Reading	g / Self study			100	
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignn	nents	Take-home and/or in tutorials	10	CLO 1,2,3	
	Examin	ation		50	CLO 1,2,3	
	Test			40	CLO 1,2,3	
Required/recommended reading and contine materials	S. Lang: J.B. Fral	leigh: A First Course	e instructor. ebra (Springer, 2004) e in Abstract Algebra (Addison-Wesley, 19 ora (Prentice-Hall, 1996)	989, 4th edition)		
		ngerford: Abstract A	lgebra: An Introduction (Saunders Collection)	ge Publishing 1990 2nd e	edition)	
Course Website	T.W. Hu	ngerford: Abstract A oodle.hku.hk/	lgebra: An Introduction (Saunders Collec	ge Publishing, 1990, 2nd e	dition)	

http://hkumath.hku.hk/~math/Timetable/timetable2021_S1.pdf

MATH3303	Matrix f	theory and its appli	ications (6 credits)	Academic Ye	ar 2020	
Offering Department	Mathema	atics		Quota		
Course Co-ordinator	Dr Y M C	Chan, Mathematics (ym	chan @maths.hku.hk)			
Teachers Involved	(Dr M Hu	uang,Mathematics)				
Course Objectives	and com and socia to variou	nbinatorics. It also plays al sciences. In this cou is kinds of practical pro	ection with other mathematical sults an important role in the developurse, students will be taught the fubblems. Mathematical software mo solve matrix problems.	oment of many subjects in s indamentals of matrix analys	cience, engineering, is and its application	
Course Contents & Topics	- Orthog application Schur's eigenvaluris - Singularis	 Eigenvalues and eigenvectors: similarities, applications on difference equations and differential equations. Orthogonality: inner products and the induced norms, orthogonality of null spaces and column spaces, applications to over- or under-determined systems, least squares fit. Unitary, normal, and hermitian matrices: Schur's triangularization theorem. Variational description of eigenvalues: applications in optimization and in eigenvalue estimation. Singular value decomposition: polar decomposition, pseudo inverse, spectral norm of matrices, interlacing inequalities for singular values. Jordan form and applications. 				
Course Learning		•	s course, students should be able	to:		
Outcomes	CLO 1 h e CLO 2 u CLO 3 u CLO 4 u CLO 5 fi	nave a good underst eigenvectors understand the concept understand the concept understand the concept ind the singular value decomposition, pseudo	anding on matrices, determina of similar matrices and the eigenv	nts, linear transformations, alue decomposition matrices oply the theory of singular values	alues to study polar	
Pre-requisites (and Co-requisites and Impermissible combinations)		MATH2101 and MATH2	•			
Offer in 2020 - 2021	N Of	ffer in 2021 - 2022 : N		Examination		
Grade Descriptors (A+ to F)	A B C D	applications through corre and being able to carry ou Demonstrate a good und applications through corre theorems or their applicat Demonstrate an acceptal but with some inadequa presentation or a number Demonstrate some under substantial inadequacies with substantial computat Demonstrate poor and ind being able to complete the	adequate understanding by not being able	antly presenting correct logical reas d with some innovative approaches I y being able to identify the approp ninor inadequacies in arguments, ic computational errors. eas by being able to correctly ident incorrectly analysing problems we eing able to correctly identify appro- tity analysing problems with poor arg	oning and argumentation o solving problems. riate theorems and their lentifying the appropriate ify appropriate theorems, ith poor argument and priate theorems, but with jument or presentation or	
Course Type	Lecture-b	based course				
Course Teaching	Activitie	es	Details		No. of Hours	
& Learning Activities	Lectures Tutorials Reading				36 12 100	
Assessment Methods and Weighting	Methods	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examina	ation		50	CLO 1,2,3,4,5,6	
Required/recommended reading and online materials	Steven J Chris Ro Roger A.	l. Leon: Linear Algebra orres & Howard Anton: A . Horn & Charles R. Joh	with Applications (McGraw-Hill, 1 with Applications (Macmillan, 1994) Applications of Linear Algebra (Winnson: Matrix Analysis (Cambridge ant Edition of Matlab (Version 4 for	4, 4th edition) ey, 1984, 3rd edition) University Press, 1987)	CLO 1,2,3,4,5,6	
Course Website		odle.hku.hk/	The Edition of Madab (Volsion 4 10)	imoroson vindows) (i ieililo	5 7 idii, 1000)	
	1100					
Additional Course	Timetable	e.				

MATH3304	Introduction to number theory (6 credits)	Academic Year	2020
Offering Department	Mathematics	Quota	
Course Co-ordinator	Dr B Kane, Mathematics (bkane@maths.hku.hk)		
Teachers Involved	(Dr B Kane, Mathematics)		
Course Objectives	To provide students with basic concepts about numbers, their properties and be congruences. The prime numbers are the building blocks of all the natural rinterplay between the multiplicative and additive properties of prime numbers is will study further properties and the distribution of the prime numbers, and problems concerning them. Important applications of number theory to mintroduced.	numbers under m particularly interes some of the lor	ultiplication. The sting. The course ngstanding open
Course Contents & Topics	 -The course will begin with some basic notions in number theory, including direction algorithm, congruences, etc. It will then be followed by several fundaremainder theorem, solutions of linear and polynomial congruences, Fermat's reciprocity law. - Many well-known open problems will be introduced. Application of number the be explained. Some current research on the prime numbers will be discussed. 	mental theorems, Little theorem, a	such as Chinese nd the quadratic

			le, the course will cover a selection the course will cover a selection the course will cover a selection to the course will be selected as the course will			
Course Learning			course, students should be able to		,	
Outcomes	CLO 1 solve a system of linear congruences					
	CLO 2 solve polynomial congruences					
				utation of the Legendre sym	nhol	
	CLO 3 determine the solubility of quadratic congruences by computation of the Legendre symbol CLO 4 determine the existence of primitive roots and use them in solving some exponential congruences					
		nderstand the prime nu	•	corving corne experiential of	ongraonooo	
			gstanding problems in number the	Orv		
Pre-requisites (and Co-requisites and Impermissible combinations)		ATH2101 and MATH22	,	,		
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	2022 : Y	Examination	May	
Grade Descriptors (A+ to F)	A	theorems and their applic	and coherent understanding of key conce ations through correctly analysing numb on and being able to carry out computation	er theoretic problems, clearly pr		
	В	applications through correct	rstanding of key concepts and ideas by tly analysing number theoretic problems, le ent logical reasoning and carry out computed	but with some minor errors/inadeq	uacies in arguments and	
	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with weak and fragmentary argument and presentation, or with moderate computational errors.					
	D Demonstrate some superficial understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation, or with substantial computational errors.					
	Fail	theorems or their application	dequate understanding of the key concerns, or not being able to complete the soluti		e to identify appropriate	
Course Type		ased course				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents	Tutorials and Assignments	10	CLO 1,2,3,4,5,6	
	Examinat	ion		50	CLO 1,2,3,4,5,6	
	Test			40	CLO 1,2,3,4,5,6	
Required/recommended reading and online materials	David M. E	Burton: Elementary Ńur	umber theory (6th edition, Pearsor nber Theory (McGraw-Hill Higher I action to number theory (Prentice I	Éducation, International Edi	tion)	
Course Website		dle.hku.hk/	to the state of th	, 2001)		
Additional Course Information	MATH330 Timetable	1 recommended but no :	t required. etable/timetable2021 S2.pdf			

MATH3401	Analysis	s I (6 credits)				Academic Year	2020
Offering Department	Mathema	tics				Quota	
Course Co-ordinator	Prof W S	Cheung, Mathema	atics (wsche	ung @hku.hk)			
Teachers Involved	(Prof W S	Cheung, Mathema	atics)				
Course Objectives		se extends to montal concepts which	0			red in Calculus and tical analysis.	introduces some
Course Contents & Topics	completer	Basic properties of metric spaces; openness; closedness; interior; closure; derived set; boundary; compactness; completeness; continuity; connectedness; pathwise connectedness; uniform continuity; uniform convergence; Banach's fixed point theorem.					
Course Learning	On succe	ssful completion of	f this course	e, students should	oe able to:		
Outcomes		emonstrate knowle pology (e.g., able				f mathematical analy	sis and point set
						alyze and handle no formly continuous)	vel situations in a
	CLO 3 think creatively and laterally to generate innovative examples and solutions to non-standard problems (e.g., able to provide counterexamples to inaccurate mathematical statements)						
Pre-requisites (and Co-requisites	Pass in M	IATH2211					
and Impermissible combinations)							
combinations)	Y 1st	sem Offer in 202	21 - 2022 : \	Y		Examination	Dec
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Y 1st	Demonstrate a thoroconcepts and apply	ough understar	nding of all concepts a s through correctly a	nalysing problems, cle	e to draw complex conne early and elegantly pres	ections among various
combinations) Offer in 2020 - 2021 Grade Descriptors		Demonstrate a thoroconcepts and apply reasoning and argun Demonstrate a good	ough understar y the theorems mentation, and d understandin n correctly anal	nding of all concepts a s through correctly a with some innovative a ng of key concepts an lysing problems, but w	nalysing problems, cle pproaches to solving p d ideas by being able	e to draw complex conne early and elegantly pres	ections among various enting correct logical te theorems and their
combinations) Offer in 2020 - 2021 Grade Descriptors	A	Demonstrate a thoroconcepts and apply reasoning and argun Demonstrate a good applications through appropriate theorem: Demonstrate an acc but with some inade presentation.	ough understar y the theorems mentation, and d understandin n correctly anal iss, applications, ceptable unders equacies in ap	nding of all concepts a s through correctly al with some innovative a ig of key concepts an ysing problems, but w , or presentation. standing of key concep plying the theorems the	nalysing problems, cle pproaches to solving p d ideas by being able th some minor inadec tots and ideas by being prough incorrectly ana	e to draw complex conne early and elegantly pres roblems. to identify the appropria uacies in arguments, rea able to correctly identify lysing problems with acc	ections among various enting correct logical te theorems and their soning, identifying the appropriate theorems, eptable argument and
combinations) Offer in 2020 - 2021 Grade Descriptors	A B C	Demonstrate a thoro concepts and apply reasoning and argun Demonstrate a good applications through appropriate theorem: Demonstrate an acc but with some inade presentation. Demonstrate some u substantial inadequa	ough understar y the theorems mentation, and d d understandin n correctly anal is, applications, ceptable unders equacies in ap understanding acies in applying	nding of all concepts as a through correctly all with some innovative a g of key concepts and ysing problems, but w, or presentation. standing of key conceptying the theorems through g the theorems through g the theorems through	nalysing problems, clipproaches to solving pd dideas by being able ith some minor inadects and ideas by being and incorrectly ana deas by being able to incorrectly analysing it incorrectly analysing it.	e to draw complex conne aarly and elegantly pres roblems. to identify the appropria uacies in arguments, rea able to correctly identify lysing problems with acc correctly identify appropri- problems with poor argum	ections among various enting correct logical te theorems and their soning, identifying the appropriate theorems, aptable argument and ate theorems, but with ent or presentation.
combinations) Offer in 2020 - 2021 Grade Descriptors	A B C	Demonstrate a thoro concepts and apply reasoning and argun Demonstrate a good applications through appropriate theorem: Demonstrate an acc but with some inade presentation. Demonstrate some u substantial inadequa	ough understar y the theorem mentation, and d understandin correctly anal is, applications, ceptable unders equacies in ap understanding acies in applying and inadequate	nding of all concepts as s through correctly as with some innovative a g of key concepts an ysing problems, but w, or presentation. standing of key concepplying the theorems though the correct of key concepts and it g the theorems through understanding by not l	nalysing problems, clipproaches to solving pd dideas by being able ith some minor inadects and ideas by being and incorrectly ana deas by being able to incorrectly analysing it incorrectly analysing it.	e to draw complex conne early and elegantly pres roblems. to identify the appropria uacies in arguments, rea able to correctly identify lysing problems with acc correctly identify appropri	ections among various enting correct logical te theorems and their soning, identifying the appropriate theorems, aptable argument and ate theorems, but with ent or presentation.
combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	A B C D Fail	Demonstrate a thoro concepts and apply reasoning and argun Demonstrate a good applications through appropriate theorem: Demonstrate an acc but with some inade presentation. Demonstrate some t substantial inadequa Demonstrate poor ai	ough understar y the theorem mentation, and d understandin correctly anal is, applications, ceptable unders equacies in ap understanding acies in applying and inadequate	nding of all concepts as s through correctly as with some innovative a g of key concepts an ysing problems, but w, or presentation. standing of key concepplying the theorems though the correct of key concepts and it g the theorems through understanding by not l	nalysing problems, clipproaches to solving pd dideas by being able ith some minor inadects and ideas by being and incorrectly ana deas by being able to incorrectly analysing it incorrectly analysing it.	e to draw complex conne aarly and elegantly pres roblems. to identify the appropria uacies in arguments, rea able to correctly identify lysing problems with acc correctly identify appropri- problems with poor argum	ections among various enting correct logical te theorems and their soning, identifying the appropriate theorems, aptable argument and ate theorems, but with ent or presentation.
combinations) Offer in 2020 - 2021 Grade Descriptors	A B C D Fail	Demonstrate a thoroconcepts and apply reasoning and argun Demonstrate a good applications through appropriate theorem: Demonstrate an acc but with some inade presentation. Demonstrate some usubstantial inadequa Demonstrate poor albeing able to compleased course	ough understar y the theorem mentation, and d understandin correctly anal is, applications, ceptable unders equacies in ap understanding acies in applying and inadequate	nding of all concepts as sthrough correctly al with some innovative a go of key concepts and ysing problems, but w, or presentation. standing of key conceplying the theorems theorems to of key concepts and it g the theorems through understanding by not be.	nalysing problems, clipproaches to solving pd dideas by being able ith some minor inadects and ideas by being and incorrectly ana deas by being able to incorrectly analysing it incorrectly analysing it.	e to draw complex conne aarly and elegantly pres roblems. to identify the appropria uacies in arguments, rea able to correctly identify lysing problems with acc correctly identify appropri- problems with poor argum	ections among various enting correct logical te theorems and their soning, identifying the appropriate theorems, aptable argument and ate theorems, but with ent or presentation.

	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Examination		50	CLO 1,2,3
	Test		50	CLO 1,2,3
Required/recommended reading and online materials	Apostol: Mathematical Analysis Rudin: Principles of Mathematical	Analysis		
Course Website	http://moodle.hku.hk/			
Additional Course Information	Timetable: http://hkumath.hku.hk/~math/Time	table/timetable2021_S1	1.pdf	

MATH3403	Function	is of a complex vari	able (6 credits)	Academic Yea	ır 2020
Offering Department	Mathemati			Quota	
Course Co-ordinator	Dr K K Wo	ng, Mathematics (kkwoi	ng @maths.hku.hk)		
Teachers Involved	(Dr K K W	ong,Mathematics)			
Course Objectives	physics. In functions a	n this course, the stud and are shown how to lo	studies in higher mathematical ents are introduced to the fur ok at analyticity from different po th of the geometric picture are e	damental concepts and pro pints of view. At the same time	perties of analytic
Course Contents & Topics	- Analytic f - The Cauchy's - Cauchy's - Taylor's s - Laurent's - Zeros, sii		ations.		
Course Learning Outcomes	CLO 2 grafor CLO 3 co CLO 4 ap	sful completion of this c cognize the theory of athematics asp the techniques fror mulas to study analytic mpute contour integrals	ourse, students should be able to functions of a complex variab m Cauchy-Riemann equations, functions from different perspect	e as a rigorous and found power series expansion and ves	d Cauchy integral
Pre-requisites (and Co-requisites and Impermissible combinations)		ATH2211 and MATH224			
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2		Examination	May
Grade Descriptors (A+ to F)	A B C D	applications through correct and being able to carry out c Demonstrate a good unders applications through correct theorems or their application Demonstrate an acceptable but with some inadequacie presentation or a number of Demonstrate some understa substantial inadequacies in a with substantial computation	anding of key concepts and ideas by be applying the theorems through incorrect	ntly presenting correct logical reaso with some innovative approaches to being able to identify the appropri inor inadequacies in arguments, ide omputational errors. as by being able to correctly identify incorrectly analysing problems with ing able to correctly identify appropri y analysing problems with poor argu-	ning and argumentation solving problems. ate theorems and their ntifying the appropriate appropriate theorems, h poor argument and riate theorems, but with ment or presentation or
	ı alı	being able to complete the s		, арраграми	,,,,
Course Type	Lecture-ba	sed course			
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures				36
	Tutorials				12
	Reading /	Self study			100
	Methods				
			Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
			Details		Methods
	Methods		Details	course grade (%)	Methods to CLO Mapping
and Weighting Required/recommended reading and	Examinati Test R.B. Ash a J. Bak & D L.V. Ahlfor K. Kodaira	on and W.P. Novinger: Com J. Newman: Complex A s: Complex Analysis (M : Introduction to Comple	plex Variables (Dover, 2nd edition Analysis, Undergraduate Texts in CGraw-Hill, 3rd edition) Ox Analysis (Cambridge)	course grade (%) 50 50 on) Mathematics (Springer-Verla	Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4
Assessment Methods and Weighting Required/recommended reading and online materials Course Website	Examinati Test R.B. Ash a J. Bak & D L.V. Ahlfor K. Kodaira J.P. Gilma	on and W.P. Novinger: Com J. Newman: Complex A s: Complex Analysis (M : Introduction to Comple	plex Variables (Dover, 2nd edition Analysis, Undergraduate Texts in CGraw-Hill, 3rd edition)	course grade (%) 50 50 on) Mathematics (Springer-Verla	Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4

MATH3405	Differential equations (6 credits)	Academic Year	2020
Offering Department	Mathematics	Quota	
Course Co-ordinator	Dr H Y Zhang, Mathematics (hyzhang@maths.hku.hk)		
Teachers Involved	(Dr H Y Zhang, Mathematics)		

Course Objectives				ntial equations (ODEs) included in mphasis is on principles rather thar	
			npromise between diversity and de		Troutine calculations
Course Contents			ferential equations.	opui.	
& Topics		nce and uniquenes	•		
			equations, Wronskian, variation of	of parameters.	
	- Power s	series method, Le	egendre polynomials, Bessel funct	tions.	
	- Linear s	systems, autonom	nous systems.		
		tive properties of s	solutions.		
		place transform.			
Course Learning		•	of this course, students should be		
Outcomes			order and second order (linear s, variation of parameters, Laplace	or nonlinear) ODEs by various te e transform, and series method	echniques, including
		•	first order linear ODEs with consta nown functions are no more than	ant coefficients, of which the numb three	per of equations and
		•	ely the solutions of nonlinear ODEs their phase diagrams	s or systems of nonlinear ODEs by	studying their linear
		apply the theory of and life sciences	f differential equations to study qu	uantitatively/qualitatively problems a	arising from physical
Pre-requisites (and Co-requisites	Pass in ((MATH2101 and M	MATH2211) or MATH2014 or (MA	TH1821 and MATH2822)	
and Impermissible					
combinations)					
Offer in 2020 - 2021	Y 2n	nd sem Offer in 2	2021 - 2022 : Y	Examination	May
Grade Descriptors (A+ to F)	A	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.			
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.				
	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and				
	presentation or a number of minor computational errors. D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or				
	Fail	with substantial computational errors.			
	-	the state of the Annual Court	and inadequate understanding by not be	eing able to identify appropriate theorems or	gument or presentation or
		being able to comp	and inadequate understanding by not be plete the solution.	eing able to identify appropriate theorems or	gument or presentation or
• • • • • • • • • • • • • • • • • • • •	Lecture-k	based course		sing able to identify appropriate theorems or	gument or presentation or
Course Teaching	Lecture-b	based course		eing able to identify appropriate theorems or	gument or presentation or
Course Teaching		based course es	plete the solution.	eing able to identify appropriate theorems or	gument or presentation or
Course Teaching	Activitie	based course es s	plete the solution.	eing able to identify appropriate theorems or	gument or presentation or r their applications, or not No. of Hours
Course Teaching	Activitie Lectures Tutorials	based course es s	plete the solution.	eing able to identify appropriate theorems or	gument or presentation of r their applications, or not No. of Hours 36
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	Activitie Lectures Tutorials	based course es s s y // Self study	plete the solution.	Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Tutorials Reading	based course es s s y // Self study	plete the solution. Details	Weighting in final	No. of Hours 36 12 100 Assessment
Course Teaching & Learning Activities Assessment Methods	Activitie Lectures Tutorials Reading Methods	based course es s s y // Self study	plete the solution. Details	Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping
Course Teaching & Learning Activities Assessment Methods	Activitie Lectures Tutorials Reading Methods	based course es s s y // Self study	plete the solution. Details	Weighting in final course grade (%)	No. of Hours No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4
Course Teaching & Learning Activities Assessment Methods and Weighting	Activitie Lectures Tutorials Reading Methods Assignm Examina Test	based course es s s y / Self study s nents attion	Details Details Details	Weighting in final course grade (%) 10 50 40	No. of Hours No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4 CLO 1,2,3,4
Course Teaching & Learning Activities Assessment Methods	Activitie Lectures Tutorials Reading Methods Assignm Examina Test On-line to http://aim R. Nagle 6th editio	based course es s s g / Self study ls nents ation textbook of William nath.org/textbooks e, E. Saff and A. S on)	Details Details Details Details n F. Trench: Elementary Differentis/approved-textbooks/trench-de/ Snider: Fundamentals of Different	Weighting in final course grade (%) 10 50 40 ial Equations with Boundary Value	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4 Problems (2013) uri
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activitie Lectures Tutorials Reading Methods Assignm Examina Test On-line th http://aim thtp://aim W.E. Boy edition)	based course es s s g / Self study ls ments ation textbook of William nath.org/textbooks e, E. Saff and A. S on) yce and R.C. DiPl	Details Details Details Details n F. Trench: Elementary Differentis/approved-textbooks/trench-de/Snider: Fundamentals of Differential Equivalent Elementary Differential Equivalent Elementary Differential Equivalent	Weighting in final course grade (%) 10 50 40 ial Equations with Boundary Value tial Equations and Boundary Value problemations and Boundary Value Problemations and Boundary Value Problematics	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4 CLO 1,2,3,4 Problems (2013) url
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Activitie Lectures Tutorials Reading Methods Assignm Examina Test On-line tr http://aim R. Nagle 6th editio W.E. Boy edition) E.A. Cod	based course es s s g / Self study s ments ation textbook of William nath.org/textbooks a, E. Saff and A. S on) cyce and R.C. DiPoddington: An Introd	Details Details Details Details n F. Trench: Elementary Differentis/approved-textbooks/trench-de/ Snider: Fundamentals of Different	Weighting in final course grade (%) 10 50 40 ial Equations with Boundary Value tial Equations and Boundary Value problemations and Boundary Value Problemations and Boundary Value Problematics	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4 CLO 1,2,3,4 Problems (2013) url
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials Course Website	Activitie Lectures Tutorials Reading Methods Assignm Examina Test On-line to http://aim R. Nagle 6th editio W.E. Boy edition) E.A. Cod http://mod	based course es s s g / Self study s nents ation textbook of William nath.org/textbooks e, E. Saff and A. S on) yce and R.C. DiPl ddington: An Introcodel hku.hk/	Details Details Details Details n F. Trench: Elementary Differentis/approved-textbooks/trench-de/Snider: Fundamentals of Differential Equivalent Elementary Differential Equivalent Elementary Differential Equivalent	Weighting in final course grade (%) 10 50 40 ial Equations with Boundary Value tial Equations and Boundary Value problemations and Boundary Value Problemations and Boundary Value Problematics	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4 CLO 1,2,3,4 Problems (2013) url
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Activitie Lectures Tutorials Reading Methods Assignm Examina Test On-line to http://aim R. Nagle 6th edition W.E. Boy edition) E.A. Cod http://mo	based course es s s g / Self study s nents ation textbook of William nath.org/textbooks e, E. Saff and A. S on) yce and R.C. DiPl ddington: An Introd oddle.hku.hk/	Details Details Details Details n F. Trench: Elementary Differentis/approved-textbooks/trench-de/Snider: Fundamentals of Differential Equivalents.	Weighting in final course grade (%) 10 50 40 ital Equations with Boundary Value tial Equations and Boundary Value Proble quations (Prentice-Hall)	No. of Hours No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4 CLO 1,2,3,4 Problems (2013) url

MATH3408	Computational methods and differential equations with applications (6 credits)	Academic Year	2020			
Offering Department	Mathematics	Quota				
Course Co-ordinator	Prof W K Ching, Mathematics (wching@hku.hk)					
Teachers Involved	(Prof W K Ching, Mathematics)					
Course Objectives	This course covers topics in the fields of differential equations, mathema which are of importance to sciences students. The emphasis is practical approximately approxima	•	•			
Course Contents & Topics	 Solution of linear difference equations. Mathematical modelling and dynamical systems. Numerical differentiation and integration. LU factorization for solving linear system of equations. Matrix norms and iterative solutions of matrix equations. Solution of nonlinear systems of equations. Elementary differential equations and power series method. Numerical solutions of ordinary and partial differential equations. Numerical solutions of systems of first-order ordinary differential equations 	·				
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 construct and implement numerical methods for numerical integration and differentiation, and the solution of linear and nonlinear system of equations					
	CLO 2 explain mathematical ideas of numerical methods and mathematical modelling in solving linear difference equations, ordinary and partial differential equations					
	CLO 3 construct one-step and linear multistep methods for the numerical solution of initial-value problems for					

		ordinary differential equa properties	tions and systems of suc	ch equations and analyze their sta	ability and accuracy	
	CLO 4			al solution of partial differential eq	uations and analyze	
		implement numerical met MATLAB	thods for solving initial and	d boundary value problems by sof	tware packages like	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	(MATH2101 and MATH22	211) or MATH2014 or (MA	TH1821 and MATH2822)		
Offer in 2020 - 2021	Y 2r	nd sem Offer in 2021 - 2	2022 : Y	Examination	May	
Grade Descriptors (A+ to F)	A	computational methods an logical reasoning and argurapproaches to solving prob	d their applications through cor mentation and being able to carr lems.	and ideas by being able to identify the a rectly analysing problems, clearly and eley out computations carefully and correctly,	gantly presenting correct and with some innovative	
	В	computational methods an	nd their applications through co appropriate theorems and compu	d ideas by being able to identify the apprectly analysing problems, but with some utational methods or their applications and p	e minor inadequacies in	
	С	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems and computational methods, but with some inadequacies in applying them through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.				
	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems and computational methods, but with substantial inadequacies in applying them through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.				
			ut with substantial inadequacies	in applying them through incorrectly analy		
	Fail	argument or presentation o Demonstrate poor and inad	ut with substantial inadequacies r with substantial computational e	in applying them through incorrectly analy errors. ing able to identify appropriate theorems an	ysing problems with poor	
Course Type		argument or presentation o Demonstrate poor and inad	ut with substantial inadequacies r with substantial computational e lequate understanding by not be	in applying them through incorrectly analy errors. ing able to identify appropriate theorems an	ysing problems with poor	
		argument or presentation o Demonstrate poor and inad or their applications, or not based course	ut with substantial inadequacies r with substantial computational e lequate understanding by not be	in applying them through incorrectly analy errors. ing able to identify appropriate theorems an	ysing problems with poor	
Course Teaching	Lecture-	argument or presentation o Demonstrate poor and inad or their applications, or not based course es	at with substantial inadequacies r with substantial computational e lequate understanding by not be being able to complete the solution	in applying them through incorrectly analy errors. ing able to identify appropriate theorems an	ysing problems with poor	
Course Teaching	Lecture-	argument or presentation o Demonstrate poor and inad or their applications, or not based course es	at with substantial inadequacies r with substantial computational e lequate understanding by not be being able to complete the solution	in applying them through incorrectly analy errors. ing able to identify appropriate theorems an	ysing problems with poor not computational methods No. of Hours	
Course Teaching	Lecture- Activitie Lectures Tutorials	argument or presentation o Demonstrate poor and inad or their applications, or not based course es	at with substantial inadequacies r with substantial computational e lequate understanding by not be being able to complete the solution	in applying them through incorrectly analy errors. ing able to identify appropriate theorems an	ysing problems with poor and computational methods No. of Hours 36	
Course Teaching & Learning Activities Assessment Methods	Lecture- Activitie Lectures Tutorials	argument or presentation o Demonstrate poor and inad or their applications, or not based course es s g / Self study	at with substantial inadequacies r with substantial computational e lequate understanding by not be being able to complete the solution	in applying them through incorrectly analy errors. ing able to identify appropriate theorems an	No. of Hours 36 12	
Course Teaching & Learning Activities Assessment Methods	Lecture- Activition Lectures Tutorials Reading	argument or presentation o Demonstrate poor and inad or their applications, or not based course es s y / Self study	ut with substantial inadequacies r with substantial computational elequate understanding by not bei being able to complete the soluti	in applying them through incorrectly analy errors. ing able to identify appropriate theorems an on. Weighting in final	No. of Hours 36 12 100 Assessment Methods	
Course Teaching & Learning Activities Assessment Methods	Lecture- Activitic Lecture: Tutorials Reading Method	argument or presentation o Demonstrate poor and inad or their applications, or not based course es s y / Self study	ut with substantial inadequacies r with substantial computational elequate understanding by not bei being able to complete the soluti	in applying them through incorrectly analyerrors. ing able to identify appropriate theorems an on. Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping	
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Lecture- Activitic Lecture: Tutorials Reading Method Examina Test D.F. Par E.A. Coo	argument or presentation o Demonstrate poor and inad or their applications, or not based course es s s g / Self study ls ation khurst: Introduction to Apddington: An Introduction	ut with substantial inadequacies r with substantial computational elequate understanding by not bei being able to complete the solution between the solution	in applying them through incorrectly analyserrors. ing able to identify appropriate theorems anon. Weighting in final course grade (%) 50 50 vironmental Science (Springer) quations (Prentice-Hall)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5	
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials Course Website	Lecture- Activitic Lecture: Tutorials Reading Method Examina Test D.F. Par E.A. Coo A. Ralsto	argument or presentation o Demonstrate poor and inad or their applications, or not based course es s s g / Self study ls ation khurst: Introduction to Apddington: An Introduction	ut with substantial inadequacies r with substantial computational elequate understanding by not being able to complete the solution being able to complete the solution between t	in applying them through incorrectly analyserrors. ing able to identify appropriate theorems anon. Weighting in final course grade (%) 50 50 vironmental Science (Springer) quations (Prentice-Hall)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5	
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Lecture- Activitic Lecture: Tutorials Reading Method Examina Test D.F. Par E.A. Coo A. Ralsto	argument or presentation o Demonstrate poor and inad or their applications, or not based course es s g / Self study ls ation khurst: Introduction to Ap ddington: An Introduction on and P. Rabinowitz: A F	ut with substantial inadequacies r with substantial computational elequate understanding by not being able to complete the solution being able to complete the solution between t	in applying them through incorrectly analyserrors. ing able to identify appropriate theorems anon. Weighting in final course grade (%) 50 50 vironmental Science (Springer) quations (Prentice-Hall)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5	

MATH3541	Introduction to topology (6 credits) Academic Year 201				2020		
Offering Department	Mathema	Quota					
Course Co-ordinator	Prof J H	Prof J H Lu, Mathematics (jhlu@maths.hku.hk)					
Teachers Involved	(Prof J H	Lu,Mathematics)					
Course Objectives	This course aims at introducing students to fundamental knowledge in topology and some of its applications. We will emphasize more on building geometric intuition and links between topology and other subjects. It can help prepare students for more advanced Mathematics and Physics courses and future research in Mathematics Physics, Computer Science and Biology.						
Course Contents & Topics	(i) Basic (ii) Topol (iii) Brou	Topics will be chosen among the following: (i) Basic point-set topology: topological spaces, product and quotient spaces. (ii) Topological groups and orbit spaces. (iii) Brouwer fixed point theorem, winding numbers. (iv) Fundamental groups, covering spaces.					
Course Learning Outcomes	CLO 1 CLO 2	understand basic cons give examples and cou	is course, students should be able tructions in point-set topology unter examples for concepts in the ' s of fundamental groups and its app	course contents"	tion problem		
Pre-requisites and Co-requisites and Impermissible combinations)		Pass in MATH2101, MATH2102 and MATH2241. Students are recommended to have passed or already enrolled in MATH3301 and MATH3401.					
Offer in 2020 - 2021	N Of	ffer in 2021 - 2022 : Y		Examination			
Grade Descriptors (A+ to F)	В	applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.					
	С						
	D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.						
	Fail	being able to complete t	inadequate understanding by not being able he solution.	e to identify appropriate theorems or the	eir applications, or no		
Course Type		pased course					
Course Teaching	Activitie		Details		No. of Hours		
& Learning Activities	Lectures				36		
-	Tutorials	1			12		
		/ Self study			100		

Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		10	CLO 1,2,3
	Examination		50	CLO 1,2,3
	Test		40	CLO 1,2,3
Required/recommended reading and online materials	Recommended reference: 1. James R. Munkres: Topology (F 2. M A. Armstrong: Basic topology			
Course Website	http://moodle.hku.hk/			
Additional Course Information	Timetable: http://hkumath.hku.hk/~math/Time	table/timetable2021_S2.pdf		

MATH3600	Discrete	e mathematics (6 cr	edits)	Academic Y	ear 2020			
Offering Department	Mathema	itics		Quota				
Course Co-ordinator	Dr K H La	K H Law, Mathematics (lawkaho@connect.hku.hk)						
Teachers Involved	(Dr K H L	Dr K H Law,Mathematics)						
Course Objectives	To introd	uce students to the basi	c ideas and techniques of discrete	mathematics.				
Course Contents & Topics	generatin - Graph t	Counting: combinations, permutations, pigeonhole principle, inclusion-exclusion, recurrence relations, and enerating functions. Graph theory: paths, circuits, trees, connectivity, planarity, etc. Applications of counting techniques and graph theory.						
Course Learning	On succe	essful completion of this	course, students should be able to	o:				
Outcomes	CLO 1 c	lemonstrate knowledge	and understanding of the basic ide	eas and techniques of discr	ete mathematics			
	CLO 2 s	olve various real-world	problems by using counting techni	ques and graph theory				
	CLO 3 d	levelop their ability to re-	ad, comprehend, and create math	ematical arguments				
Pre-requisites (and Co-requisites and Impermissible combinations)			of Level 2 MATH courses) or (M (MATH1821 and MATH2822)	ATH1851 and MATH1853	and any 1 of level 2			
Offer in 2020 - 2021	Y 1st	t sem Offer in 2021 - 2	2022 : Y	Examination	n Dec			
Grade Descriptors (A+ to F)	A	applications through correct	understanding of key concepts and ideas ctly analysing problems, clearly and elega computations carefully and correctly, and	ntly presenting correct logical rea	soning and argumentation			
	and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems. B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.							
	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.							
	D							
	Fail	being able to complete the	dequate understanding by not being able solution.	to identify appropriate theorems of	or their applications, or no			
Course Type		ased course						
Course Teaching	Activitie		Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials				12			
	Reading / Self study				100			
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignm	ents	assignments, tutorials, participation, etc	10	CLO 1,2,3			
	Examina	tion		50	CLO 1,2,3			
	Test			40	CLO 1,2,3			
Required/recommended reading and online materials	Richard A	A. Brualdi: Introductory (Combinatorics (Pearson)					
Course Website	http://mod	odle.hku.hk/						
Additional Course Information	Timetable	e:	etable/timetable2021 S1.pdf					

MATH3601	Numerical analysis (6 credits)	Academic Year	2020
Offering Department	Mathematics	Quota	
Course Co-ordinator	Dr Z Zhang, Mathematics (zhangzw@maths.hku.hk)		
Teachers Involved	(Dr Z Zhang,Mathematics)		
Course Objectives	This course covers both the theoretical and practical aspects of numerical a principles and numerical methods of solution, using high speed computers.	nalysis. Emphasis	will be on basic
Course Contents & Topics	 Different types of errors, condition number, and convergence order. Polynomial interpolation and function approximation. Solution of equations of one variable. Direct and iterative methods for solving linear systems. Numerical differentiation and integration. Simple initial value problems for Ordinary Differential Equations. 		
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 construct and implement algorithms to find the zeros of functions, apply fixed point iteration methods; and construct and implement Newtor nonlinear equations	,	,

	CLO 2 ap	ply direct and iterative	e methods for solving li	inear equation systems				
	CLO 3 co	CLO 3 construct interpolation polynomials in Lagrange, Newton, Hermite and spline forms CLO 4 understand the basic numerical integration and differentiation methods						
	CLO 4 un	derstand the basic nu	umerical integration and	d differentiation methods	•			
	CLO 5 ap	ply Euler methods an	d Runge-Kutta method	ls to solve initial value pro	oblems			
	CLO 6 us	CLO 6 use software package such as Scilab or Matlab or Python to solve numerical problems						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in (M	ass in (MATH2101 and MATH2211) or MATH2014 or (MATH1821 and MATH2822)						
Offer in 2020 - 2021	Y 1st	/ 1st sem Offer in 2021 - 2022 : Y Examination Dec						
Grade Descriptors (A+ to F)	Α	theorems/algorithms and reasoning and argumenta approaches to solving pro	their applications through c ation and being able to carry oblems.	concepts and methods by orrectly analysing problems, clop out numerical procedures care	early and elegantly fully and correctly,	presenting correct logical and with some innovative		
	В	and their applications the	rough correctly analysing p	and methods by being able to roblems, but with some minor me minor computational errors.	inadequacies in ar	riate theorems/algorithms rguments, identifying the		
	С							
	D							
	Fail	Demonstrate poor and applications, or not being		by not being able to identify	appropriate theor	ems/algorithms or their		
Course Type	Lecture-ba	ased course						
Course Teaching	Activities	3	Details			No. of Hours		
& Learning Activities	Lectures					36		
	Tutorials					12		
	Reading /	Self study				100		
Assessment Methods and Weighting	Methods		Details		hting in final se grade (%)	Assessment Methods to CLO Mapping		
	Examinati	ion			50	CLO 1,2,3,4,5,6		
	Test				50	CLO 1,2,3,4,5,6		
Required/recommended	Instructor's Lecture Notes A. Ralston and P. Rabinowitz:		A First Course in Nume	rical Analysis (McGraw-F	1:11\			
reading and online materials					ıııı <i>)</i>			
	K. E. Atkin		to Numerical Analysis					
online materials	K. E. Atkin	nson: An Introduction t dle.hku.hk/						

	Probab	ility theory (6 credi	s)	Academic Year	2020		
Offering Department	Mathema			Quota			
Course Co-ordinator	Dr Z Qu, Mathematics (zhengqu@maths.hku.hk)						
Teachers Involved	(Dr Z Qu,Mathematics)						
Course Objectives	The emphasis of this course will be on probability models and their applications. The primary aim is to elucidate the fundamental principles of probability theory through examples and to develop the ability of the students to apply what they have learned from this course to widely divergent concrete problems.						
Course Contents & Topics Course Learning	-Basic probability theory: random variable, discrete and continuous probability distributions, expectation, variance, moment generating function, strong law of large numbers, central limit theorem. -Conditional probability theory: conditional probability, Bayes theorem, conditional expectation, conditional variance, compound random variable, Polya's urn model, Bose-Einstein statistics. -Markov chain theory: concepts of states and transition probability, irreducibility, stationary distribution, limiting probabilities, reversibility, hidden Markov chain, applications in marketing and genetic problems, branching process, Markov decision process. -Poisson process and reliability theory: exponential distribution, memoryless property, Poisson process, concepts of reliability, applications to server queue problems. On successful completion of this course, students should be able to:						
Outcomes	CLO 1 L	understand and recognizexplain the typical proof problems	e the fundamental principles of probabs and computational techniques in pro and understanding of various types of	bability theory and apply t	them to concrete		
Pre-requisites	Pass in (MATH2101 and MATH2211) or MATH2014 or (MATH1821 and MATH2822)						
and Impermissible							
and Impermissible combinations)	Y 1s	st sem Offer in 2021 - :	2022 : Y	Examination	Dec		
and Impermissible combinations) Offer in 2020 - 2021	Y 1s	Demonstrate an excellent applications through corre and being able to carry ou	understanding of key concepts and ideas by be ctly analysing problems, clearly and elegantly pit t computations carefully and correctly, and with s	ing able to identify the appropriate resenting correct logical reasoning come innovative approaches to so	te theorems and their ng and argumentation olving problems.		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	В	Demonstrate an excellent applications through corre and being able to carry ou Demonstrate a good und applications through corre theorems or their applicati	understanding of key concepts and ideas by be ctly analysing problems, clearly and elegantly property of computations carefully and correctly, and with serstanding of key concepts and ideas by being ctly analysing problems, but with some minor in ons and presentation or with some minor compul	ing able to identify the appropriat resenting correct logical reasonin some innovative approaches to sc g able to identify the appropriate adequacies in arguments, identi- tational errors.	the theorems and their grand argumentation of the solution problems. The theorems and their fifying the appropriate		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A	Demonstrate an excellent applications through corre and being able to carry ou Demonstrate a good und applications through corre theorems or their application Demonstrate an acceptabut with some inadequa presentation or a number	understanding of key concepts and ideas by be ctly analysing problems, clearly and elegantly port computations carefully and correctly, and with serstanding of key concepts and ideas by being ctly analysing problems, but with some minor irons and presentation or with some minor compute understanding of key concepts and ideas by cies in applying the theorems through incorrof minor computational errors.	ing able to identify the appropriative senting correct logical reasoning to the innovative approaches to so a pable to identify the appropriate adequacies in arguments, identifational errors. being able to correctly identify a ectly analysing problems with	te theorems and their og and argumentation olving problems. e theorems and their ffying the appropriate appropriate theorems, poor argument and		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	A B C	Demonstrate an excellent applications through correr and being able to carry ou Demonstrate a good und applications through corre theorems or their applications through corresponding to their application with some inadequa presentation or a number Demonstrate some under substantial inadequacies with substantial computation.	understanding of key concepts and ideas by be ctly analysing problems, clearly and elegantly pit to computations carefully and correctly, and with s erstanding of key concepts and ideas by being ctly analysing problems, but with some minor in ons and presentation or with some minor comput le understanding of key concepts and ideas by cies in applying the theorems through incorr of minor computational errors. standing of key concepts and ideas by being at n applying the theorems through incorrectly anal onal errors.	ing able to identify the appropriat resenting correct logical reasoning come innovative approaches to so g able to identify the appropriate adequacies in arguments, identitational errors. being able to correctly identify a ectly analysing problems with ole to correctly identify appropriat lysing problems with poor arguments.	te theorems and their ing and argumentation olving problems. • theorems and their ifying the appropriate appropriate theorems, poor argument and te theorems, but with ent or presentation or		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	A B C D	Demonstrate an excellent applications through corre and being able to carry ou Demonstrate a good und applications through corre theorems or their application Demonstrate an acceptable but with some inadequa presentation or a number Demonstrate some under substantial inadequacies i with substantial computati Demonstrate poor and inseling able to complete the	understanding of key concepts and ideas by be ctly analysing problems, clearly and elegantly problems, clearly and elegantly problems, clearly and elegantly problems, clearly and elegantly problems, but with some minor in comparts and presentation or with some minor compute understanding of key concepts and ideas by cies in applying the theorems through incorrors finition computational errors. Standing of key concepts and ideas by being at an applying the theorems through incorrectly analonal errors. dequate understanding by not being able to ide	ing able to identify the appropriat resenting correct logical reasoning come innovative approaches to so g able to identify the appropriate adequacies in arguments, identitational errors. being able to correctly identify a ectly analysing problems with ole to correctly identify appropriat lysing problems with poor arguments.	te theorems and their ing and argumentation olving problems. • theorems and their ifying the appropriate appropriate theorems, poor argument and te theorems, but with ent or presentation or		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A B C D	Demonstrate an excellent applications through corre and being able to carry ou Demonstrate a good und applications through corre theorems or their application but with some inadequa presentation or a number Demonstrate some under substantial inadequacies with substantial computation bemonstrate poor and incommendation or a number Demonstrate poor and incommendatio	understanding of key concepts and ideas by be ctly analysing problems, clearly and elegantly problems, clearly and elegantly problems, clearly and elegantly problems, clearly and elegantly problems, but with some minor in comparts and presentation or with some minor compute understanding of key concepts and ideas by cies in applying the theorems through incorrors finition computational errors. Standing of key concepts and ideas by being at an applying the theorems through incorrectly analonal errors. dequate understanding by not being able to ide	ing able to identify the appropriat resenting correct logical reasoning come innovative approaches to so g able to identify the appropriate adequacies in arguments, identitational errors. being able to correctly identify a ectly analysing problems with ole to correctly identify appropriat lysing problems with poor arguments.	te theorems and their ing and argumentation olving problems. • theorems and their ifying the appropriate appropriate theorems, poor argument and te theorems, but with ent or presentation or		

	Lectures			36
	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments	Coursework assessment	10	CLO 1,2,3
	Examination		50	CLO 1,2,3
	Test	Two midterm tests	40	CLO 1,2,3
Required/recommended reading and online materials	S.M. Ross: Introduction to Prob	ability Models (Academic Press, 20	007, 9th ed.)	
Course Website	http://moodle.hku.hk/			
Additional Course Information	Timetable: http://hkumath.hku.hk/~math/Ti	metable/timetable2021_S1.pdf		

MATH3901	Operation	ons research I (6 cr	edits)	Academic Ye	ar 2020		
Offering Department	Mathemat			Quota			
Course Co-ordinator	Dr Z Qu, N	Dr Z Qu, Mathematics (zhengqu@maths.hku.hk)					
Teachers Involved	(Dr Z Qu,	(Dr Z Qu,Mathematics)					
Course Objectives	and its religion parametric. There is a together with the second control of the second	The objective is to provide a fundamental account of the basic results and techniques of Linear Programming (LP) and its related topics in operations research. The topics include the simplex method, the dual simplex method, parametric programming, decomposition method, cutting plane methods and branch and bound. There is an equal emphasis on all the three aspects of theories, algorithms and applications. The course serves, together with the course MATH3943 Network Models in Operations Research, as essential concept and					
Course Contents & Topics	Linear prDuality thSensitivitEllipsoid	background for more advanced studies in operations research. - Linear programming - Duality theory - Sensitivity analysis and parametric linear programming - Ellipsoid methods - Interior point methods					
Course Learning	On succes	ssful completion of this	course, students should be able to:				
Outcomes	of CLO 2 de ex	operations research emonstrate knowledge ttensions such as the di	ntal concept and approach of linear and understanding of the underlyin ual simplex algorithm and the decore theory of integer programming	ng techniques of the simp			
Pre-requisites		ATH2014 or MATH210	, , , , ,				
(and Co-requisites and Impermissible combinations)	Pass III IVI	ATH2014 OF MATH2 10	TOTMATH2102				
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2	022 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	В	theorems, algorithms and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and to solve problems with some innovative approaches.					
	С	algorithms and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors. Demonstrate an acceptable understanding of key concepts and ideas by being able to identify basic principles, appropriate the concept algorithms and their applications but with some inadequacies in combinar the theorems therefore the problems are concepts and ideas by being able to identify basic principles, appropriate					
		theorems, algorithms and their applications but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.					
	D						
	Fail Demonstrate poor and inadequate understanding by not being able to identify basic principles, appropriate theorems, algorithms or their applications, or not being able to complete or compute the solution.						
Course Type	Lecture-ba	ased course					
			Details				
• •	Activities	5	Details		No. of Hours		
Course Teaching	Activities Lectures	3	Details		No. of Hours		
Course Teaching		3	Details				
Course Teaching	Lectures Tutorials	Self study	Details		36		
Course Teaching & Learning Activities Assessment Methods	Lectures Tutorials		Details	Weighting in final	36 12 100 Assessment		
Course Teaching & Learning Activities Assessment Methods	Lectures Tutorials Reading /			Weighting in final course grade (%)	36 12 100 Assessment Methods		
Course Teaching & Learning Activities Assessment Methods	Lectures Tutorials Reading / Methods	Self study	Details	course grade (%)	36 12 100 Assessment Methods to CLO Mapping		
Course Teaching & Learning Activities Assessment Methods	Lectures Tutorials Reading / Methods Assignme	Self study		course grade (%)	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3		
Course Teaching & Learning Activities Assessment Methods	Lectures Tutorials Reading / Methods Assignme Examinati	Self study	Details Coursework assessment	course grade (%) 10 50	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3		
Course Teaching & Learning Activities Assessment Methods and Weighting	Lectures Tutorials Reading / Methods Assignme Examinati Test	Self study ents ion	Details Coursework assessment Two midterm tests	course grade (%) 10 50 40	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Lectures Tutorials Reading / Methods Assignme Examinati Test J.P. Ignizic D. Bertsim	Self study ents ion o and T.M. Cavalier: Lir nas and J.N. Tsitsiklis: I	Details Coursework assessment Two midterm tests near Programming (Prentice-Hall Introduction to Linear Optimization ()	course grade (%) 10 50 40 ternational, 1994) Athena Scientific, 1997)	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Lectures Tutorials Reading / Methods Assignme Examinati Test J.P. Ignizic D. Bertsim W.L. Wins	Self study ents ion o and T.M. Cavalier: Lir nas and J.N. Tsitsiklis: I	Details Coursework assessment Two midterm tests near Programming (Prentice-Hall Integration)	course grade (%) 10 50 40 ternational, 1994) Athena Scientific, 1997)	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3		
Course Teaching & Learning Activities	Lectures Tutorials Reading / Methods Assignme Examinati Test J.P. Ignizic D. Bertsim W.L. Wins	ents ion o and T.M. Cavalier: Lir nas and J.N. Tsitsiklis: I ston: Introduction to Mat dle.hku.hk/	Details Coursework assessment Two midterm tests near Programming (Prentice-Hall Introduction to Linear Optimization ()	course grade (%) 10 50 40 ternational, 1994) Athena Scientific, 1997)	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3		

MATH3904	Introduction to optimization (6 credits)	Academic Year	2020
Offering Department	Mathematics	Quota	
Course Co-ordinator	Prof W Zang, Mathematics (wzang@maths.hku.hk)		
Teachers Involved	(Prof W Zang, Mathematics)		

Course Objectives	This course introduces students to the theory and techniques of optimization, aiming at preparing them for further studies in operations research, mathematical economics and related subject areas.					
Course Contents & Topics	 - Unconstrained and constrained optimization. - Necessary conditions and sufficient conditions for optimality, convexity, duality. - Algorithms and numerical examples. 					
Course Learning	On succe	ssful completion of this	course, students should	be able to:		
Outcomes	CLO 1 demonstrate knowledge and understanding of the basic theory and techniques of optimization					
		olve various optimization	•	•		
		nderstand the connection ehavior of algorithms for		analytical character of an optimization	on problem and the	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in (N	MATH2101 and MATH22	211) or MATH2014 or (N	MATH1821 and MATH2822)		
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2	022 : Y	Examination	Dec	
Grade Descriptors (A+ to F)	A	applications through correct	tly analysing problems, clearl	s and ideas by being able to identify the appro y and elegantly presenting correct logical reas prectly, and with some innovative approaches t	oning and argumentation	
	В					
	С	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.				
	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.				
	Fail	Demonstrate poor and inad being able to complete the		being able to identify appropriate theorems or	their applications, or not	
Course Type	Lecture-b	ased course				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examinat	tion		50	CLO 1,2,3	
	Test			50	CLO 1,2,3	
Required/recommended reading and online materials	Instructor	's lecture notes				
Course Website	http://mod	odle.hku.hk/				
Additional Course	Timetable					
			etable/timetable2021 S			

MATH3905	Queuei	ng theory and sim	nulation (6 credits)	Academic Year	2020		
Offering Department	Mathema		Quota				
Course Co-ordinator	Dr G Har	Dr G Han, Mathematics (ghan @maths.hku.hk)					
Teachers Involved							
Course Objectives	This course introduces students to the models and theory of queueing system, as well as the technique of simulation as a practical tool of analysis.						
Course Contents & Topics	 Markov, birth-and-death, and Poisson processes, exponential models. Markovian queueing networks. Imbedded Markov-chain queueing models. Simulation of queueing models and discrete-event systems. Introduction of the Monte Carlo (MC) method and Markov Chain Monte Carlo (MCMC) method. 						
Course Learning	On succe	essful completion of th	is course, students should be able to:				
Outcomes	CLO 1 L	inderstand the termino	ology and nomenclature appropriate to q	queueing theory			
	CLO 2	lemonstrate knowledg	ge and understanding of various queuein	ng models			
	CLO 3 f	ormulate concrete pro	blems using queueing theoretical appro-	aches			
	CLO 4 become familiar with fundamental principles of simulation and compare different simulation techniques						
	CLO 5 use Monte Carlo method and Markov Chain Monte Carlo method to conduct numerical						
Pre-requisites		ise Monte Carlo metho		od to conduct numerical si	mulations		
(and Co-requisites and Impermissible combinations)	Pass in (ise Monte Carlo metho MATH2101 and MATH	od and Markov Chain Monte Carlo meth	nod to conduct numerical sind MATH2822)	mulations		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	Pass in (ise Monte Carlo metho MATH2101 and MATH fer in 2021 - 2022 : Y	od and Markov Chain Monte Carlo meth H2211) or MATH2014 or (MATH1821 an	nod to conduct numerical sind MATH2822) Examination			
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Pass in (se Monte Carlo methor MATH2101 and MATH fer in 2021 - 2022 : Y Demonstrate an excelle applications through cor	od and Markov Chain Monte Carlo meth	Examination being able to identify appropriat	 e theorems and their ng and argumentation		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in (fer in 2021 - 2022 : Y Demonstrate an excelle applications through cor and being able to carry of Demonstrate a good u applications through cor theorems or their applica	od and Markov Chain Monte Carlo meth H2211) or MATH2014 or (MATH1821 and ent understanding of key concepts and ideas by prectly analysing problems, clearly and elegantly pout computations carefully and correctly, and to so understanding of key concepts and ideas by be rectly analysing problems, but with some minor ations and presentation or with some minor computations and presentation or with some minor computations and presentation or with some minor computations.	Examination being able to identify appropriate presenting correct logical reasonious problems with some innovative ing able to identify appropriate inadequacies in arguments, identitational errors.	e theorems and their g and argumentation e approaches. theorems and their tifying the appropriate		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in (N Of	fer in 2021 - 2022 : Y Demonstrate an excelle applications through cor and being able to carry of Demonstrate a good u applications through cor theorems or their applications through cor theorems or their applications through cor theorems or their applications through cor theorems or their applications through cor theorems or their applications through correctly the with some inadequiles.	od and Markov Chain Monte Carlo meth H2211) or MATH2014 or (MATH1821 and ent understanding of key concepts and ideas by the trectly analysing problems, clearly and elegantly pout computations carefully and correctly, and to so understanding of key concepts and ideas by be trectly analysing problems, but with some minor in the content of the concepts and ideas by the concepts and	Examination being able to identify appropriate problems with some innovative inadequacies in arguments, identify appropriate inadequacies in arguments, identify appropriate inadequacies in arguments, identify able to correctly identify a being able to correctly identify a propriate inadequacies in arguments, identify a propriate inadequacies in arguments, identify a being able to correctly identify a propriate in a propri	e theorems and their ng and argumentation te approaches. Theorems and their tifying the appropriate		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in (fer in 2021 - 2022 : Y Demonstrate an excelle applications through cor and being able to carry of Demonstrate a good u applications through cor theorems or their applications through cor beorems or their applications through cor beautiful applications and the properties of the prop	od and Markov Chain Monte Carlo meth H2211) or MATH2014 or (MATH1821 and ent understanding of key concepts and ideas by prectly analysing problems, clearly and elegantly gout computations carefully and correctly, and to sourcest and ideas by be rectly analysing problems, but with some minor computations and presentation or with some minor computations and presentation or with some minor computations and presentation or with some minor computations and presentation or with some minor computational errors. It is applying the theorems through incorrectly and s in applying the theorems through incorrectly and s in applying the theorems through incorrectly and s in applying the theorems through incorrectly and s in applying the theorems through incorrectly and s in applying the theorems through incorrectly and s in applying the theorems through incorrectly and s in applying the theorems through incorrectly and s in applying the theorems through incorrectly and s in a problem.	Examination being able to identify appropriate presenting correct logical reasonic blve problems with some innovative ing able to identify appropriate inadequacies in arguments, identitational errors. It is being able to correctly identify a problems with able to correctly identify appropriate in a problems with able to correctly identify appropriate in a problems with able to correctly identify appropriate in a problem in a probl	e theorems and their ng and argumentation e approaches. In theorems and their tifying the appropriate theorems, poor argument and te theorems, but with		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Pass in (N Of A B C D	fer in 2021 - 2022: Y Demonstrate an excelle applications through cor and being able to carry of theorems or their applications through cor theorems or their applications through cor theorems or their applications through cor bearing able to carry of the application of their application or a number of their application or a number of their application or a number of their application or a number of their application or a number of their application or a number of their application or an under or their application or an under or their application or their application or their application or their application or their application or their application or their application or their application or their application or their application or their application or their applications or their	od and Markov Chain Monte Carlo meth H2211) or MATH2014 or (MATH1821 and H2211) or MATH2014 or (MATH1821 and H2211) or MATH2014 or (MATH1821 and H2211) or MATH2014 or (MATH1821 and H2211) or MATH2014 or (MATH1821 and H2211) or MATH2014 or (MATH1821 and H2211) or MATH2014 or MATH201	Examination being able to identify appropriate presenting correct logical reasonious problems with some innovative eing able to identify appropriate inadequacies in arguments, identitational errors. y being able to correctly identify a propriate inadequacies in gruments, identitational errors. y being able to correctly identify a propriate analysing problems with able to correctly identify appropriatelysing problems with poor arguments.	e theorems and their ng and argumentation e approaches. I theorems and their tifying the appropriate theorems, poor argument and tet theorems, but with tent or presentation or		
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Pass in (N Of A B C D Fail Lecture-t	fer in 2021 - 2022: Y Demonstrate an excelle applications through cor and being able to carry of theorems or their applications through cor theorems or their applications through cor theorems or their applications through cor beautiful applications through cor theorems or their applications through cor beautiful applications through cor theorems or their applications through correct a growth some inadequipresentation or a number of the proposition of the propositio	od and Markov Chain Monte Carlo meth H2211) or MATH2014 or (MATH1821 and ent understanding of key concepts and ideas by prectly analysing problems, clearly and elegantly go understanding of key concepts and ideas by be rectly analysing problems, but with some minor ations and presentation or with some minor computations and presentation of key concepts and ideas by being a sin applying the theorems through incorrectly analysing of key concepts and ideas by being a s in applying the theorems through incorrectly analysing all errors.	Examination being able to identify appropriate presenting correct logical reasonious problems with some innovative eing able to identify appropriate inadequacies in arguments, identitational errors. y being able to correctly identify a propriate inadequacies in gruments, identitational errors. y being able to correctly identify a propriate analysing problems with able to correctly identify appropriatelysing problems with poor arguments.	e theorems and their gand argumentation e approaches. In theorems and their tifying the appropriate theorems, poor argument and te theorems, but with lent or presentation or eir applications, or not		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in (N Of A B C D	fer in 2021 - 2022: Y Demonstrate an excelle applications through cor and being able to carry of theorems or their applications through cor theorems or their applications through cor theorems or their applications through cor beautiful applications through cor theorems or their applications through cor beautiful applications through cor theorems or their applications through correct a growth some inadequipresentation or a number of the proposition of the propositio	od and Markov Chain Monte Carlo meth H2211) or MATH2014 or (MATH1821 and H2211) or MATH2014 or (MATH1821 and H2211) or MATH2014 or (MATH1821 and H2211) or MATH2014 or (MATH1821 and H2211) or MATH2014 or (MATH1821 and H2211) or MATH2014 or (MATH1821 and H2211) or MATH2014 or MATH201	Examination being able to identify appropriate presenting correct logical reasonious problems with some innovative eing able to identify appropriate inadequacies in arguments, identitational errors. y being able to correctly identify a propriate inadequacies in gruments, identitational errors. y being able to correctly identify a propriate analysing problems with able to correctly identify appropriatelysing problems with poor arguments.	e theorems and their ng and argumentation e approaches. I theorems and their tifying the appropriate theorems, poor argument and tet theorems, but with tent or presentation or		

	Tutorials			12	
	Reading / Self study			100	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examination		50	CLO 1,2,3,4,5	
	Test		50	CLO 1,2,3,4,5	
Required/recommended reading and online materials	R.B. Cooper: Introduction to Queueing Theory (Edward Arnold, 1981, 2nd ed.) S.M. Ross: Introduction to Probability Models (Academic Press, 1993, 7th ed., San Diego, California) S.M. Ross: A Course in Simulation (Macmillan, 1991) P. Glasserman: Monte Carlo Methods in Financial Engineering (Springer Science & Business Media, 2004)				
Course Website	http://moodle.hku.hk/		•	,	

MATH3906	Financi	al calculus (6 credits	s)	Academic Ye	ar 2020			
Offering Department	Mathema	tics		Quota				
Course Co-ordinator	Dr G Li, N	Mathematics (lotusli@ma	ths.hku.hk)					
Teachers Involved	(Dr G Li,N	Mathematics)						
Course Objectives			treatment for the modeling of fina					
		rom an applied mathematician's point of view. Stochastic calculus and solution methods will be introduced. An introduction to financial instruments: stocks, bonds, options, forward and future contracts.						
Course Contents & Topics			iments: stocks, bonds, options, foi inship, no arbitrage principle. Bro		lculus Ito's Lemma			
a ropics			ng partial differential equation.	Willan Motion, Stochastic Ce	ilculus, 110 3 Eciliilla			
			es model, American options, pa	th dependent options. Bin	omial tree Models			
		Martingale.	, , , , , ,					
Course Learning	On succe	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 u	nderstand the terminolog	gy and nature of bonds, interest ra	ates, forwards, futures, stoc	ks, options, and the			
	n	o-arbitrage-principle						
	CLO 2 d	emonstrate knowledge o	n using binomial tree models to fir	nd option prices via the risk-	neutral concept			
			of a Brownian motion and the Bla					
			culus (such as Ito's Lemma) to o					
			of options; and find a solution to th	•				
Pre-requisites	Pass in (I	MATH2101 and MATH22	211) or MATH2014 or (MATH1821	and MATH2822) or STAT2	2601			
(and Co-requisites								
and Impermissible								
combinations) Offer in 2020 - 2021	Y 2n	d sem Offer in 2021 - 2	1022 · V	Examination	Mov			
Grade Descriptors	A 211		nderstanding of key concepts and ideas b		May			
(A+ to F)	A		tly analysing problems, clearly and elegan					
(A: 101)			computations carefully and correctly, and v					
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate							
	applications inrough correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.							
	С	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems						
	but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.							
	D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with							
	substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation							
	with substantial computational errors. Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or no							
	being able to complete the solution.							
Course Type	Lecture-b	ased course						
Course Teaching	Activitie	S	Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials				12			
	Reading / Self study				100			
Assessment Methods	Methods	3	Details	Weighting in final	Assessment			
and Weighting				course grade (%)	Methods			
					to CLO Mapping			
	Examination			50	CLO 1,2,3,4			
	Test			50	CLO 1,2,3,4			
Required/recommended		O	al Calculus (Cambridge University	,				
reading and		r and A. Rennie: Financ	ial Calculus: An Introduction to E	Derivative Pricing (Cambride	ge University Press			
online materials	1996)		TI M () (F) (F)	D : " (O I : I II	D 4005			
			ne: The Mathematics of Financial		iversity Press, 1995			
Course Website			tive Securities (South-Western Co	illege Publishing, 1994)				
Additional Course	Timetable	odle.hku.hk/						
nformation			etable/timetable2021 S2.pdf					
moniauon	Πιιρ.//IIKU	mani.mv.mv/~mani/11me	table/tillletable2021_32.pul					

MATH3911	Game theory and strategy (6 credits)	Academic Year	2020
Offering Department	Mathematics	Quota	
Course Co-ordinator	Dr K H Law, Mathematics (lawkaho@connect.hku.hk)		
Teachers Involved	(Dr K H Law, Mathematics)		
Course Objectives	Game theory is the logical analysis of situations of conflict and cooperation. This to the basic ideas and techniques of mathematical game theory in an interdiscipling		duce the students
Course Contents & Topics	 Combinatorial games and Zermelo's Theorem; Prisonner's Dilemma; pure theorem; mixed Nash equilibria. Application to biology: evolutionary stable strategies; games in coalition form; SI Application to politics: Shapley-Shubik power index; core and von Neumann-Mo 	napley value.	,
Course Learning	On successful completion of this course, students should be able to:	•	

Outcomes	CLO 1 understand the basic terminology and solution concepts in game theory CLO 2 compute explicitly different solution concepts for some simple cooperative and non-cooperative game							
					operative games			
	CLO 3 a	apply game theoretical id	deas and methods to solve some	problems in economics and	biology			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in (Pass in (MATH2101 and MATH2211) or (MATH1821 and MATH2822)						
Offer in 2020 - 2021	Y 2n	2nd sem Offer in 2021 - 2022 : Y Examination May						
Grade Descriptors (A+ to F)	A	theorems and their applica	understanding of key concepts and idea ations through correctly analysing problem computations carefully and correctly, and	ns, clearly and elegantly presentin	g correct logical reasoning			
	В	theorems and their appli	erstanding of key concepts and ideas of cations through correctly analysing proletheorems or their applications and presen	blems, but with some minor ina	dequacies in arguments,			
	С	Demonstrate an acceptate appropriate theorems, but	ole understanding of key concepts and with some inadequacies in applying the or a number of minor computational erro	ideas of Game Theory by being theorems through incorrectly ana	able to correctly identify			
	Demonstrate some understanding of key concepts and ideas of Game Theory by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.							
	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.							
Course Type	Lecture-b	pased course						
Course Teaching	Activities Details No. of Ho							
& Learning Activities	Lectures	1		36				
	Tutorials			12				
	Reading	/ Self study			100			
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignm	ents	assignments, tutorials, participation etc	5	CLO 1,2,3			
	Examina	ition		50	CLO 1,2,3			
	Project r	eports		20	CLO 1,2,3			
	Test			25	CLO 1,2,3			
Required/recommended reading and online materials	[Referen		, Theory and Applications (Dover Allison M. Pacelli, Mathematics		ng, Power, and Proof			
Course Website		odle.hku.hk/						
Additional Course	Timetable							
Information			estable/timetable2021 S2 adf					
IIIIOIIIIauoii	TIMP.//TIKU	ttp://hkumath.hku.hk/~math/Timetable/timetable2021_S2.pdf						

MATH3943	Networ	k models in oper	rations research (6 credits)	Acad	emic Year	2020
Offering Department	Mathema	atics	•	Quot	a	
Course Co-ordinator	Prof W Z	ang, Mathematics (v	vzang@maths.hku.hk)			
Teachers Involved	(Prof W 2	Zang,Mathematics)	,			
Course Objectives	operation application	ns research. There ons. The course serv	a fundamental account of the ba is an equal emphasis on all ves, together with a course on lin- ed studies in operations research.	three aspects of unde	erstanding,	algorithms and
Course Contents & Topics	- Trees, r - Network - Ford-Fu - Applica	ılkerson network flov	tation and assignment problems. v theory and computation for maxi al optimization problems such as a			
Course Learning	On succe	essful completion of t	this course, students should be ab	le to:		
Outcomes		inderstand the fundaurther study of opera	amental concept and approach c tions research	f graphs and network	models ap	propriate to the
	CLO 2 demonstrate knowledge and understanding of the underlying techniques of the various graph algorithms and their extensions CLO 3 understand the theory of network flows and the duality aspects in such methods of flow compa					•
Pre-requisites and Co-requisites and Impermissible combinations)	Pass in (MATH2101 and MA	TH2211) or MATH2014; and dy enrolled in this course.			
Offer in 2020 - 2021	N Of	ffer in 2021 - 2022 : \	Y	Exam	ination	
Grade Descriptors (A+ to F)	Α	theorems, algorithms	ellent understanding of key concepts and and their applications through correctly and entation and being able to carry out compu- s.	alysing problems, clearly and	elegantly pres	senting correct logical
	В					
	Demonstrate an acceptable understanding of key concepts and ideas by being able to identify basic principles, appropriate theorems, algorithms and their applications but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.					
	D Demonstrate some understanding of key concepts and ideas by being able to identify basic principles, appropriate theorems algorithms and their applications but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.					
	Fail		d inadequate understanding by not being a r not being able to complete or compute th		s, appropriate	theorems, algorithms
0 T	Lecture-h	pased course				
Course Type Course Teaching	Lootalo k	Jasea Course				

	Lectures			36
	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Examination		50	CLO 1,2,3
	Test		50	CLO 1,2,3
Required/recommended reading and online materials	M.S. Bazaraa, J.J. Jarvis and H.D R.K. Ahuja, T.L. Magnanti and J.L H.A. Taha: Operations Research:	. Orlin: Network Flows: Theo		
Course Website	http://moodle.hku.hk/	,		
Additional Course Information	Timetable: http://hkumath.hku.hk/~math/Time	table/timetable2021 S2.pdf		

MATH3999	Directed	l studies in mathema	atics (6 credits)	Academic Ye	ear 2020			
Offering Department	Mathemat	tics		Quota				
Course Co-ordinator	Prof X Yu	an, Mathematics (xmyua	n @hku.hk)					
Teachers Involved	(All teachi	(All teaching staff, Mathematics)						
Course Objectives	This cours	This course is designed for students who would like to have early experiences on research related independent studies.						
Course Contents & Topics	student m	The subject matter of the project will be determined by consultation between the student and the supervisor. The student must achieve good standing and get the approval from both the prospective supervisor and the course coordinator to take this course.						
Course Learning	On succes	On successful completion of this course, students should be able to:						
Outcomes	CLO 1	study independently a top	pic that is not available in the reg	ular curriculum				
	CLO 2	understand how mathem	atical theories are applied and/or	extended in problem-solvir	ng			
	CLO 3	gain experience in projec	ct writing and oral presentation					
Pre-requisites (and Co-requisites and Impermissible combinations)	only. The Pass in a MATH4XX	This capstone course is for Mathematics / Mathematics (Intensive), and Mathematics/Physics Majors students only. The earliest that a student is allowed to take this capstone course is their year 3 study. Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX MATH4XXX or MATH7XXX) in the Mathematics/ Mathematics (Intensive), and Mathematics/Physics Majors, in addition to a pass in MATH2101, MATH2102, MATH2211 and MATH2241; and subject to approval by the						
Offer in 2020 - 2021	Y 1st	sem 2nd sem Offer i	n 2021 - 2022 : Y	Examination	No Exam			
Grade Descriptors (A+ to F)	В	original thought. Insightful ureference aptly. Critical us organizational and presentat Demonstrate substantial grarelevant information from so	p of the subject. Show strong analytical se and critical evaluation of information e of data and results to draw appropional skills. asp of the subject. Evidence of analytical urces, showing ability to make meaningfrect use of data of results to draw appropriate to the subject.	drawn from a broad range of hig briate and insightful conclusions al and critical abilities and logical ul comparisons between different	h quality sources and to Apply highly effective thinking. Critical use of secondary interpretations			
	С							
	D Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Demonstrate use and reference of several sources, but mainly through summary rather than analysis and comparison. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.							
	Fail Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Limited use of secondary sources and no critical comparison of them. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.							
Course Type	Project-ba	ased course						
Course Teaching	Activities	5	Details		No. of Hours			
& Learning Activities	Reading	/ Self study	independent work & to attend m	eetings & seminars	120			
Assessment Methods and Weighting	Methods	·	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Dissertati	on	Written report plus oral presentation	100	CLO 1,2,3			
Additional Course Information	students application	presentation presentation 100 CLO 1,2,3 The offered topics and application procedure are released by email from the Department. Sophomore or abstudents who have declared Major in Mathematics/Mathematics (Intensive) will receive emails in June. application results will be announced in late July or early August. For enquiry, please contact the Department. The final report must be submitted by the end of the semester. The deadline for submission will be announced.						

MATH4302	Algebra II (6 credits) Academic Year 2020				
Offering Department	Mathematics	Quota			
Course Co-ordinator	Prof J H Lu, Mathematics (jhlu@maths.hku.hk)				
Teachers Involved	(Prof J H Lu, Mathematics)				
Course Objectives	This course is an extension of MATH3301 and continues with more advance be followed by MATH7501 and MATH7502.	d topics in algebra.	The course may		
Course Contents & Topics	 Principal ideal domains and unique factorization domains; Structure theorem for finitely generated modules of principal ideal domains abelian groups and canonical forms of matrices; Field extensions; introduction to Galois theory. 	with applications to	finitely generated		
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 understand basic examples of principal ideal domains and why p	rincipal ideal dom	ains are unique		
	factorization domains				

Additional Course Information	Timetable	:		able/timetable202				
Course Website	http://moc	dle.hku.hk/						
Required/recommended reading and online materials	http://hom T.W. Hun	gerford: Abstrac	ct Algebra:	Abstract goodman/algebra : An Introduction e: Abstract Algebi	Brooks/Co	le, 1997, 2nd e	(-	book) url:
	Test						40	CLO 1,2,3,4
	Examinat	ion					50	CLO 1,2,3,4
	Assignme						10	CLO 1,2,3,4
and Weighting	Wethous			Details			rse grade (%)	Methods to CLO Mapping
Assessment Methods	Methods	•		Details		Woi	ghting in final	Assessment
	Tutorials Reading / Self study							12
& Learning Activities	Lectures							36 12
Course Teaching & Learning Activities	Activities	8		Details				No. of Hours
Course Type		ased course						
	Fail	being able to cor			by not being a	able to identify app	ropriate theorems or	their applications, or no
	D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.							
	С	but with some presentation or a	inadequacies number of n	s in applying the the ninor computational e	eorems throu	igh incorrectly ar	alysing problems w	fy appropriate theorems ith poor argument and
	В	applications thro	ugh correctly applications	analysing problems and presentation or	but with som	ne minor inadequa nor computational e	cies in arguments, id errors.	iate theorems and the entifying the appropriat
Grade Descriptors (A+ to F)	A	applications thro	ugh correctly carry out co	analysing problems, omputations carefully	clearly and e	legantly presenting and with some inn	g correct logical reason	
Offer in 2020 - 2021			2021 - 20				Examination	May
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in MATH2102 and MATH3301						
	CLO 4 compute examples of Galois groups							
				plitting fields of ir	educible po	olynomials		
	fo	rms of matrices	i	n of finitely gene				

MATH4402	Analysis	II (6 credits)			Academic Year	2020	
Offering Department	Mathemat	ics			Quota		
Course Co-ordinator	Dr Y M Ch	an, Mathematics (ym	chan @maths.hku.hk)				
Teachers Involved	(Dr Y M C	han,Mathematics)					
Course Objectives	treatment		ensive and rigorous treatment n the language of differential fo				
Course Contents & Topics	theorem, in a line of the control of	 Differentiation of functions of several variables: partial derivatives, differential, differentiability, inverse function theorem, implicit function theorem, submanifolds in R^n, method of Lagrange multipliers. Integration in R^n: Basic definitions, measure zero and content zero sets, integrability, Fubini's Theorem, partition of unity, change of variables. Integration on chains: tensors, alternating tensors, vector fields, differential forms, Poincare Lemma, Stokes' 					
Course Learning	On succes	sful completion of thi	s course, students should be ab	ole to:			
Outcomes	CLO 1 de	monstrate knowledg	e and understanding of the manipulate differential forms)		e of mathematic	al analysis and	
	CLO 2 apply knowledge and skills acquired in mathematical analysis to analyze and handle novel situations in a critical way (e.g., able to determine the differentiability and integrability of specific functions)						
	CLO 3 think creatively and laterally to generate innovative solutions to novel problems (e.g., able to do of specific functions on chains)						
				utions to nover pro	bicino (c.g., abic	to do integration	
(and Co-requisites and Impermissible		specific functions on		ations to nover pro	solomo (c.g., abic	, to do integration	
(and Co-requisites and Impermissible combinations)	Pass in M	specific functions on	chains) ¯	duons to nover pro	Examination	May	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	Pass in MA Y 2nd	specific functions on ATH3401 sem Offer in 2021 Demonstrate an exceller applications through corr and being able to carry o	chains) - 2022 : Y it understanding of key concepts and ic ectly analysing problems, clearly and e ut computations carefully and correctly,	leas by being able to elegantly presenting or and with some innove	Examination identify the appropria prrect logical reasonir ative approaches to so	May te theorems and their ng and argumentation olving problems.	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in Ma	specific functions on ATH3401 sem Offer in 2021 Demonstrate an exceller applications through cor and being able to carry of Demonstrate a good un applications through corresponding to the seminary of the	chains) - 2022 : Y It understanding of key concepts and icectly analysing problems, clearly and e	leas by being able to elegantly presenting α and with some innove s by being able to id ne minor inadequacies	Examination identify the appropriatorrect logical reasonirative approaches to scentify the appropriates in arguments, identi	May te theorems and their g and argumentation olving problems. e theorems and their	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in MA Y 2nd	specific functions on ATH3401 sem Offer in 2021 Demonstrate an exceller applications through cor and being able to carry of Demonstrate a good un applications through correms or their applications through contections or their applications through contents or their applications through contents and accepta but with some inadequipment.	chains) - 2022: Y It understanding of key concepts and ic ectly analysing problems, clearly and cut computations carefully and correctly, derstanding of key concepts and idea ectly analysing problems, but with son	deas by being able to elegantly presenting or and with some innoves by being able to id ne minor inadequacies nor computational erro dideas by being able	Examination identify the appropriatorrect logical reasonintive approaches to seentify the appropriates in arguments, identifies. to correctly identify a	May te theorems and their ng and argumentation olving problems. theorems and their ifying the appropriate	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 2nd A B	specific functions on ATH3401 sem Offer in 2021 Demonstrate an exceller applications through corrand being able to carry of Demonstrate a good un applications through correspond to theorems or their applications through corresponding to the corresponding to t	chains) - 2022: Y It understanding of key concepts and it ectly analysing problems, clearly and cut computations carefully and correctly, derstanding of key concepts and idea ectly analysing problems, but with son tions and presentation or with some mit ble understanding of key concepts and cacies in applying the theorems throof minor computational errors. restanding of key concepts and ideas be in applying the theorems through inco	deas by being able to elegantly presenting or and with some innovas by being able to idne minor inadequacies for computational error dideas by being able ugh incorrectly analy by being able to correct	Examination identify the appropriatorect logical reasoning the approaches to so entify the appropriates in arguments, identify a sing problems with cety identify appropriate with cety identify appropriation.	May te theorems and their g and argumentation olving problems. e theorems and their ifying the appropriate appropriate theorems, poor argument and te theorems, but with	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 2nd A B	specific functions on ATH3401 sem Offer in 2021 Demonstrate an exceller applications through cor and being able to carry of Demonstrate a good un applications through corresponded by the orems or their applications through corresponded by the orems or their applications through corresponded by the orems or their applications or a number of the orems or a number of th	chains) - 2022: Y It understanding of key concepts and ic ectly analysing problems, clearly and out computations carefully and correctly, derstanding of key concepts and idea rectly analysing problems, but with son tions and presentation or with some minute ble understanding of key concepts and idea in applying the theorems through finding of key concepts and ideas to in applying the theorems through incoltional errors.	deas by being able to allegantly presenting or and with some innove is by being able to id the minor inadequacies for computational error dideas by being able ugh incorrectly analy by being able to correctly analysing problem.	Examination identify the appropria prect logical reasonir ative approaches to se entify the appropriate is in arguments, ident irs. to correctly identify a sing problems with ctly identify appropria ems with poor argume	May te theorems and their g and argumentation blving problems. theorems and their ifying the appropriate appropriate theorems, poor argument and te theorems, but with ent or presentation or	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Y 2nd A B C D	specific functions on ATH3401 sem Offer in 2021 Demonstrate an exceller applications through corr and being able to carry on Demonstrate a good un applications through corr theorems or their applica Demonstrate an accepta but with some inadequu presentation or a number Demonstrate some unde substantial inadequacies with substantial computa Demonstrate poor and in Demonstrate poor and in Demonstrate poor and in the substantial computa Demonstrate poor and in the substantial computa Demonstrate poor and in the substantial computa Demonstrate poor and in the substantial computa the substantial computa the substantial computa the substantial computa the substantial computa the substantial computa the substantial computa the substantial computa the substantial computa the substantial computa the substantial computa the substantial computa the substantial computa the substantial computa the substantial computa the substantial computation the su	chains) - 2022: Y It understanding of key concepts and ic ectly analysing problems, clearly and out computations carefully and correctly, derstanding of key concepts and idea rectly analysing problems, but with son tions and presentation or with some minute ble understanding of key concepts and idea in applying the theorems through finding of key concepts and ideas to in applying the theorems through incoltional errors.	deas by being able to allegantly presenting or and with some innove is by being able to id the minor inadequacies for computational error dideas by being able ugh incorrectly analy by being able to correctly analysing problem.	Examination identify the appropria prect logical reasonir ative approaches to se entify the appropriate is in arguments, ident irs. to correctly identify a sing problems with ctly identify appropria ems with poor argume	May te theorems and their g and argumentation blving problems. e theorems and their ifying the appropriate appropriate theorems, poor argument and te theorems, but with ent or presentation or	
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching & Learning Activities	Y 2nd A B C D	specific functions on ATH3401 sem Offer in 2021 Demonstrate an exceller applications through corrand being able to carry of Demonstrate a good un applications through correct theorems or their applica Demonstrate an accepta but with some inadequ presentation or a number Demonstrate some unde substantial inadequacies with substantial computa Demonstrate poor and in being able to complete the ased course	chains) - 2022: Y It understanding of key concepts and ic ectly analysing problems, clearly and out computations carefully and correctly, derstanding of key concepts and idea rectly analysing problems, but with son tions and presentation or with some minute ble understanding of key concepts and idea in applying the theorems through finding of key concepts and ideas to in applying the theorems through incoltional errors.	deas by being able to allegantly presenting or and with some innove is by being able to id the minor inadequacies for computational error dideas by being able ugh incorrectly analy by being able to correctly analysing problem.	Examination identify the appropria prect logical reasonir ative approaches to se entify the appropriate is in arguments, ident irs. to correctly identify a sing problems with ctly identify appropria ems with poor argume	May te theorems and their g and argumentation blving problems. e theorems and their ifying the appropriate appropriate theorems, poor argument and te theorems, but with ent or presentation or	

	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Examination		50	CLO 1,2,3
	Test		50	CLO 1,2,3
Required/recommended reading and online materials	Apostol: Mathematical Analysis Munkres: Analysis on Manifolds Rudin: Principles of Mathematical Spivak: Calculus on Manifolds	Analysis		
Course Website	http://moodle.hku.hk/			
Additional Course Information	Timetable: http://hkumath.hku.hk/~math/Time	etable/timetable2021_S2.pdf		

MATH4404	Function	nal analysis (6 credi	its)	Academic Yea	r 2020		
Offering Department	Mathemati	cs		Quota			
Course Co-ordinator	Dr C W Wo	ong, Mathematics <i>(cww</i>	ongab @hku.hk)				
Teachers Involved	(Dr C W W	ong,Mathematics)					
Course Objectives		This course introduces students to the basic knowledge of linear functional analysis, an important branch of modern analysis.					
Course Contents & Topics	dimension - Inner pro series rela Riesz's rep - Fundame theorem, u	Normed spaces, Banach spaces: Finite dimensional normed spaces and subspaces. Compactness and finite dimension. Bounded linear operators. Normed spaces of operators, dual space. Inner product spaces, Hilbert spaces: Orthogonal complements, direct sums. Orthonormal sets and sequences, series related to orthonormal sets and sequences. Total orthonormal sets and sequences. Special polynomials. Riesz's representation theorem. Adjoint operator, self-adjoint, normal and unitary operators. Fundamental theorems for normed and Banach spaces: Hahn-Banach theorem. Reflexive spaces. Category heorem, uniform boundedness principle. Open mapping theorem. Closed graph theorem.					
Course Learning	On succes	sful completion of this o	course, students should be abl	e to:			
Outcomes	On successful completion of this course, students should be able to: CLO 1 compare and contrast (i) finite and infinite dimensional linear spaces, (ii) complete and incomplete linear space, and (iii) normed and inner product spaces; in particular, recognize the importance of completenes and discuss how vectors are represented in these spaces CLO 2 understand the notions of Banach spaces and Hilbert Spaces. State and apply fundamental theorems in these spaces						
			f some standard Banach space	ectra of special linear operators			
Pre-requisites			MATH2211, MATH2241 and N	•			
(and Co-requisites and Impermissible combinations)	1 433 111 1017	1112101, MATTI2102, 1	MATTIZZTT, MATTIZZ4T aliu N	IIA 1110401			
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	2022 : Y	Examination	May		
Grade Descriptors (A+ to F)	B C D	applications through correct and being able to carry out of Demonstrate a good under applications through correct theorems or their application Demonstrate an acceptable but with some inadequaci presentation or a number of Demonstrate some underst substantial inadequacies in with substantial computation Demonstrate poor and inad	ent understanding of key concepts and ideas by being able to identify the appropriate theorems and the irrectly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentatic out computations carefully and correctly, and with some innovative approaches to solving problems, inderstanding of key concepts and ideas by being able to identify the appropriate theorems and the identifications and presentation or with some minor computational errors. table understanding of key concepts and ideas by being able to correctly identify appropriate theorems quacies in applying the theorems through incorrectly analysing problems with poor argument and er of minor computational errors. derstanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with ses in applying the theorems through incorrectly analysing problems with poor argument or presentation of the properties o				
		being able to complete the s	solution.				
Course Type	_	sed course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading /	Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	nts		10	CLO 1,2,3,4		
	Examination			50	CLO 1,2,3,4		
	Test			40	CLO 1,2,3,4		
Required/recommended reading and	Erwin Krey	szig: Introductory Func	tional Analysis with Applicatio	ns (John-Wiley and Sons, 1978)			
online materials	I- 44 //	dl - 1-1 1-1./					
Course Website		dle.hku.hk/					
Additional Course Information	Timetable: http://hkum		etable/timetable2021 S2.pdf				

MATH4406	Introduction to partial differential equations (6 credits)	Academic Year	2020
Offering Department	Mathematics	Quota	
Course Co-ordinator	Dr T K Wong, Mathematics (takkwong@maths.hku.hk)		
Teachers Involved	(Dr T K Wong, Mathematics)		
Course Objectives	This course introduces students to the basic techniques for solving partial diunderlying theories.	fferential equation	s as well as the

Course Contents & Topics	 - Laplace, heat and wave equations. Classification of partial differential equations. Boundary-value, initial-value and eigenvalue problems. Separation of variables, Fourier series, linearity and superposition, Duhamel's principle, characteristic method. - Green's function, generalized functions and fundamental solutions. - Maximum principle, existence, uniqueness and continuous dependence on data. - If time permits Cauchy-Kowalevski theorem, variational method, nonlinear partial differential equations. 						
Course Learning			course, students should be ab				
Outcomes				al analysis in a coherent way to I			
		CLO 2 understand the basic theory of partial differential equations and the methods to solve them CLO 3 apply the knowledge of partial differential equations to physical sciences and engineering					
Pre-requisites		ATH2101, MATH2102,	•	priysical sciences and engineer	irig		
(and Co-requisites and Impermissible combinations)		ATH3405, or already er					
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2	022 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	A	applications through correct and being able to carry out	tly analysing problems, clearly and e computations carefully and correctly,	leas by being able to identify the approper legantly presenting correct logical reasond with some innovative approaches to	oning and argumentation o solving problems.		
	В	applications through correct theorems or their application	ctly analysing problems, but with som ns and presentation or with some mir		dentifying the appropriate		
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.						
	D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.						
	Fail	being able to complete the		able to identify appropriate theorems or	their applications, or not		
Course Type		ased course					
Course Teaching	Activities	i	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
		Calfatualu			100		
Accessment Matheda		Self study	D (1)	M. 1. I d 1. 6 1	100		
Assessment Methods and Weighting	Methods	Self study	Details	Weighting in final course grade (%)	100 Assessment Methods to CLO Mapping		
		,	Details		Assessment Methods		
	Methods	ents	Details	course grade (%)	Assessment Methods to CLO Mapping		
	Methods Assignme	ents	Details	course grade (%)	Assessment Methods to CLO Mapping CLO 1,2,3		
and Weighting	Assignme Examinati Test - W.A. Stra - R. Habe Pearson c - D. Bleecl	ents ion auss: Partial Differentia rman: Applied partial d :2013 5th ed. ker & G. Csordas: Basi	I Equations: An Introduction, Fifferential equations: with Fou	course grade (%) 10 50	Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3 CLO 1,2,3 d ed. problems, Boston:		
and Weighting Required/recommended reading and	Assignme Examinati Test - W.A. Stra - R. Habe Pearson c - D. Bleecl - L.C. Eval	ents ion auss: Partial Differentia rman: Applied partial d :2013 5th ed. ker & G. Csordas: Basi	I Equations: An Introduction, Fifferential equations: with Fou	course grade (%) 10 50 40 Hoboken, N.J.: Wiley c2008 2nd prier series and boundary value Cambridge, Mass.: Internation	Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3 CLO 1,2,3 d ed. problems, Boston:		
and Weighting Required/recommended reading and online materials	Assignme Examinati Test - W.A. Stra - R. Habe Pearson c - D. Bleecl - L.C. Eval	ents ion auss: Partial Differentia rman: Applied partial d :2013 5th ed. ker & G. Csordas: Basi ns: Partial differential ed dle.hku.hk/	I Equations: An Introduction, Fifferential equations: with Fou	course grade (%) 10 50 40 Hoboken, N.J.: Wiley c2008 2nd prier series and boundary value Cambridge, Mass.: Internation	Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3 CLO 1,2,3 d ed. problems, Boston:		

MATH4501	Geomet	ry (6 credits)		Academic Year	2020	
Offering Department	Mathema	ics		Quota		
Course Co-ordinator	Dr Z Hua,	Mathematics (huazheng@maths.hku.hk)				
Teachers Involved	(Dr Z Hua	Mathematics)				
Course Objectives	As geometric forms often appear in nature, the study of geometry helps us to understand better the universe in which we live. Moreover, geometry has much intrinsic beauty and the study of it is an excellent training in intuitive thinking. In this course we study the differential geometry of curves and surfaces in 3-space. In the study of regular surfaces in 3-space we exhibit geometric notions that are definable in terms of metrical properties of these surfaces alone, leading to the intrinsic geometry of surfaces.					
Course Contents & Topics	- The Ga Theorem. - Riemani	 Plane and space curves, regular surfaces in three-dimensional Euclidean space. The Gauss map, Gaussian and mean curvatures, Gauss's Theorema Egregium, geodesics, Gauss-Bonnet Theorem. Riemannian Geometry of surfaces; applications. 				
0		plications, e.g. to Maxwell theory of electroma				
Course Learning Outcomes	CLO 1 CLO 2	sful completion of this course, students shoul nderstand the fundamental properties of curv ompute and interpret the Frenet apparatus, fu nderstand the basics of intrinsic geometry of	es and surfaces in space Indamental forms and thei	r derived quantit	ies	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in (N	IATH2101 and MATH2211); and IATH3401 or MATH3403 or MATH3405). are strongly recommended to have taken MAT				
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2022 : Y		Examination	Dec	
Grade Descriptors (A+ to F)	Α	Demonstrate an excellent understanding of key concer applications through correctly analysing problems, clear and being able to carry out computations carefully and	arly and elegantly presenting concorrectly, and with some innovat	rect logical reasonin	g and argumentation	
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.					
	С	Demonstrate an acceptable understanding of key conbut with some inadequacies in applying the theore presentation or a number of minor computational errors	ems through incorrectly analys			
	D	Demonstrate some understanding of key concepts an substantial inadequacies in applying the theorems thro with substantial computational errors.	d ideas by being able to correct			

	Fail	Demonstrate poor and being able to complete		being able to identify appropriate theorems or	their applications, or not	
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	i	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examinati	on		50	CLO 1,2,3	
	Test			50	CLO 1,2,3	
Required/recommended reading and online materials	M P Do Carmo: Differential Geometry of Curves and Surfaces (Prentice-Hall, 1976)					
Course Website	http://mood	http://moodle.hku.hk/				
Additional Course	Timetable:	Timetable:				
Information	http://hkum	nath.hku.hk/~math/T	imetable/timetable2021_S	1.pdf		

MATH4511	Introduc	tion to differentiab	le manifolds (6 credits)	Academic Ye	ar 2020		
Offering Department	Mathemat	ics		Quota			
Course Co-ordinator	Prof J H L	u, Mathematics (jhlu@r	maths.hku.hk)				
Teachers Involved	(Prof J H L	Prof J H Lu,Mathematics)					
Course Objectives		he course aims at introducing students to the notion of differentiable manifolds and basic concepts and tools for neir study. The course also aims at presenting concrete examples that are relevant to further fields of study.					
Course Contents & Topics	- Differenti	Review on functions of several variables, inverse mapping theorem, implicit function theorem. Differentiable manifolds: definitions and examples. Maps between manifolds, submanifolds. Differential forms and exterior differentiation. Integration on manifolds.					
Course Learning	On succes	sful completion of this	course, students should be able	to:			
Outcomes	CLO 1 sp bu	eak the language of on the language of on the language of the	differentiable manifolds such as on manifolds	that of vector fields, difference			
		esent a number of ex amples	amples of differentiable manifo	lds and carry out explicit ca	alculations on such		
Pre-requisites (and Co-requisites and Impermissible combinations)		ATH3401 or MATH35	41. It would be helpful if stude	ents have also taken or are	concurrently taking		
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	2022 : N	Examination	May		
Grade Descriptors (A+ to F)	A	Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.					
	В						
	С	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.					
	D	· · · · · · · · · · · · · · · · · · ·					
	Pail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.						
Course Type	Lecture-ba	ased course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading /	Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents		10	CLO 1,2		
	Examinati			50	CLO 1,2		
	Test 40 CLO 1,2						
Required/recommended	W. Boothb	v: An introduction to dif	fferential manifolds and Riemann	nian Geometry (Academic Pre	/		
reading and online materials		W. Boothby: An introduction to differential manifolds and Riemannian Geometry (Academic Press, 2002, 2nd Ed.) John M. Lee: Introduction to smooth manifolds (Springer, 2002)					
Course Website	http://moo	dle.hku.hk/					
Additional Course	Timetable:						
Information	http://hkun	nath.hku.hk/~math/Time	etable/timetable2021_S2.pdf				

MATH4602	Scientific computing (6 credits)	Academic Year	2020			
Offering Department	Mathematics	Quota				
Course Co-ordinator	Prof W K Ching, Mathematics (wching @hku.hk)					
Teachers Involved	(Prof W K Ching, Mathematics)					
Course Objectives	To learn some basic theoretical and computational techniques for solving scientific computing problems.					
Course Contents & Topics	This course covers matrix computation problems, least squares problems, numerical methods in differential equations and partial differential equations, etc. The contents may slightly vary from year to year.					
Course Learning	On successful completion of this course, students should be able to:	om year to year.				

	CIO1	CLO 1 apply direct methods to solve linear systems					
Outcomes	CLO 2 apply iterative methods to solve linear systems						
	CLO 3 apply basic numerical methods to compute eigenvalues and eigenvectors of a matrix						
			e decomposition and understand				
		•	and numerical methods for leas				
		117	s to solve differential equations	and partial differential equation	ns		
Pre-requisites	Pass in M	ATH3601					
(and Co-requisites							
and Impermissible combinations)							
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	022 · V	Evenination	Mov		
			UZZ : Y understanding of key concepts and id-	Examination	May		
Grade Descriptors (A+ to F)	A	numerical algorithms and the	eir applications through correctly analys on and being able to carry out comp	sing problems, clearly and elegantly p	presenting correct logical		
	В	algorithms and their applic	standing of key concepts and ideas by lations through correctly analysing proteorems and numerical algorithms	oblems, but with some minor inade	equacies in arguments,		
	С	and numerical algorithms,	understanding of key concepts and ic but with some inadequacies in apply or a number of minor computational err	ing them through incorrectly analys			
	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems and numerical algorithms, but with substantial inadequacies in applying them through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.						
	Fail	· ·					
	Lecture-based course						
Course Teaching	Lecture-ba		Details		No. of Hours		
Course Teaching	Activities Lectures				36		
Course Teaching	Activities				36 12		
Course Teaching	Activities Lectures Tutorials				36		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Tutorials	1		Weighting in final course grade (%)	36 12		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Tutorials Reading /	Self study	Details		36 12 100 Assessment Methods		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Tutorials Reading / Methods	Self study	Details	course grade (%)	36 12 100 Assessment Methods to CLO Mapping		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Tutorials Reading / Methods Assignme	Self study	Details Details	course grade (%)	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6		
Course Teaching & Learning Activities Assessment Methods and Weighting	Activities Lectures Tutorials Reading / Methods Assignme Examinati Test	Self study ents	Details Details Final exam	course grade (%) 10 50	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended	Activities Lectures Tutorials Reading / Methods Assignme Examinati Test Michael T.	Self study ents ion Heath: Scientific Comp	Details Details Final exam uting (McGraw Hill, 1997)	course grade (%) 10 50 40	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activities Lectures Tutorials Reading / Methods Assignme Examinati Test Michael T. Charles F.	Self study Ints Ion Heath: Scientific Comp Van Loan: Introduction	Details Details Final exam	course grade (%) 10 50 40 Curriculum Series (Prentice I	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activities Lectures Tutorials Reading / Methods Assignme Examinati Test Michael T. Charles F. James W.	Self study Ints Ion Heath: Scientific Comp Van Loan: Introduction Demmel: Applied Num	Details Details Final exam uting (McGraw Hill, 1997) to Scientific Computing, Matlaberical Linear Algebra, SIAM, 1 A	course grade (%) 10 50 40 Curriculum Series (Prentice I	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activities Lectures Tutorials Reading / Methods Assignme Examinati Test Michael T. Charles F. James W. Paul Glass	Self study Ints Into Into Into Into Introduction Introdu	Details Details Final exam uting (McGraw Hill, 1997) to Scientific Computing, Matlab	course grade (%) 10 50 40 Curriculum Series (Prentice I	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activities Lectures Tutorials Reading / Methods Assignme Examinati Test Michael T. Charles F. James W. Paul Glass Peter E. K	Self study Ints Ion Heath: Scientific Comp Van Loan: Introduction Demmel: Applied Num Berman: Monte Carlo Me Ioeden and Eckhard Pla	Details Details Final exam uting (McGraw Hill, 1997) to Scientific Computing, Matlaberical Linear Algebra, SIAM, 1 Aethods in Financial Engineering	course grade (%) 10 50 40 Curriculum Series (Prentice I Aug 1997 Springer New York, 19 Nov 2 Chastic Differential Equations	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activities Lectures Tutorials Reading / Methods Assignme Examinati Test Michael T. Charles F. James W. Paul Glass Peter E. K K.W. Mori	Self study Ints Ints Ints Ints Ints Introduction Introdu	Details Details Final exam uting (McGraw Hill, 1997) to Scientific Computing, Matlaberical Linear Algebra, SIAM, 1 Algebra, SIAM, 1 Algebra, Summerical Solution of Stock Morton, Numerical Solution of ridge University Press	course grade (%) 10 50 40 Curriculum Series (Prentice I Aug 1997 , Springer New York, 19 Nov 2 thastic Differential Equations F Partial Differential Equations	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 Hall, 1997)		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activities Lectures Tutorials Reading / Methods Assignme Examinati Test Michael T. Charles F. James W. Paul Glass Peter E. K K.W. Mori	Self study Ints Ints Ints Ints Ints Introduction Introdu	Details Details Final exam uting (McGraw Hill, 1997) to Scientific Computing, Matlaberical Linear Algebra, SIAM, 1 Abthods in Financial Engineering Iten: Numerical Solution of Stoc Morton, Numerical Solution of	course grade (%) 10 50 40 Curriculum Series (Prentice I Aug 1997 , Springer New York, 19 Nov 2 thastic Differential Equations F Partial Differential Equations	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 Hall, 1997)		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activities Lectures Tutorials Reading / Methods Assignme Examinati Test Michael T. Charles F. James W. Paul Glass Peter E. K K.W. Mori Published Walter Ga (Springer,	Self study The study	Details Details Final exam uting (McGraw Hill, 1997) to Scientific Computing, Matlaberical Linear Algebra, SIAM, 1 Algebra, SIAM, 1 Algebra, Summerical Solution of Stock Morton, Numerical Solution of ridge University Press	course grade (%) 10 50 40 Curriculum Series (Prentice I Aug 1997 , Springer New York, 19 Nov 2 thastic Differential Equations F Partial Differential Equations	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 Hall, 1997)		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Activities Lectures Tutorials Reading / Methods Assignme Examinati Test Michael T. Charles F. James W. Paul Glass Peter E. K K.W. Mori Published Walter Ga (Springer,	Self study Ints Ints Ints Ints Ints Introduction Introdu	Details Details Final exam uting (McGraw Hill, 1997) to Scientific Computing, Matlaberical Linear Algebra, SIAM, 1 Algebra, SIAM, 1 Algebra, Summerical Solution of Stock Morton, Numerical Solution of ridge University Press	course grade (%) 10 50 40 Curriculum Series (Prentice I Aug 1997 , Springer New York, 19 Nov 2 thastic Differential Equations F Partial Differential Equations	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 Hall, 1997)		
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials Course Website Additional Course	Activities Lectures Tutorials Reading / Methods Assignme Examinati Test Michael T. Charles F. James W. Paul Glass Peter E. K K.W. Mori Published Walter Ga (Springer,	Self study The study	Details Details Final exam uting (McGraw Hill, 1997) to Scientific Computing, Matlaberical Linear Algebra, SIAM, 1 Algebra, SIAM, 1 Algebra, Summerical Solution of Stock Morton, Numerical Solution of ridge University Press	course grade (%) 10 50 40 Curriculum Series (Prentice I Aug 1997 , Springer New York, 19 Nov 2 thastic Differential Equations F Partial Differential Equations	36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 Hall, 1997)		

MATH4902	Operations research II (6 credits)	Academic Year	2020			
Offering Department	Mathematics	Quota				
Course Co-ordinator	Dr G Han, Mathematics (ghan @maths.hku.hk)					
Teachers Involved						
Course Objectives	The objective is to provide a fundamental account of the basic results (DP), Markov decision processes (MDP), Queueing Theory (QT) and s emphasis on aspects of algorithms as well as applications. The cours programming and network models, to provide essential optimization of studies in operations research.	imulation in operations re e serves, together with o	esearch. There i courses on linea			
Course Contents & Topics	- Dynamic programming (deterministic/stochastic) - Markov decision process (discounted/average costs) - Queueing Theory - Simulation					
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 understand the terminology and nomenclature appropriate to dynamic programming, Markov decision process, queueing theory and simulation CLO 2 explain the typical techniques employed in dynamic programming, Markov decision process, queueing					
	theory and simulation					
	CLO 3 demonstrate the knowledge on algorithms for a variety of problems in operations research					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in MATH2101, MATH2211 and MATH3603.					
Offer in 2020 - 2021	N Offer in 2021 - 2022 : N	Examination				
Grade Descriptors (A+ to F)	A Demonstrate an excellent understanding of key concepts and ideas by theorems, algorithms and their applications through correctly analysing prob reasoning and argumentation and being able to carry out computations care innovative approaches.	lems, clearly and elegantly pres	enting correct logic			
	B Demonstrate a good understanding of key concepts and ideas by being able to identify basic principles, appropriate theorems, algorithms and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.					
	C Demonstrate an acceptable understanding of key concepts and ideas by theorems, algorithms and their applications but with some inadequacies in					

Course Type	D Fail	Demonstrate some unde algorithms and their ap problems with poor argu Demonstrate poor and in	problems with poor argument and presentation or a number of minor computational errors. Demonstrate some understanding of key concepts and ideas by being able to identify basic principles, appropriate theorems algorithms and their applications but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors. Demonstrate poor and inadequate understanding by not being able to identify basic principles, appropriate theorems, algorithms or their applications, or not being able to complete or compute the solution.				
Course Type Course Teaching	Activitie		Details		No. of Hours		
& Learning Activities	Lectures		Details		36		
.	Tutorials				12		
	Reading / Self study				100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examina	ation		50	CLO 1,2,3		
	Test			50	CLO 1,2,3		
Required/recommended reading and online materials	P. Thie: I	S. Dreyfus and A. Law: The Art and Theory of Dynamic Programming (Academic Press, 1977) P. Thie: Markov Decision Processes (COMAP, Inc. 1983) S. M. Ross: Introduction to Probability Models (Academic Press, 2007, 9th ed.)					
Course Website	http://mo	odle.hku.hk/					

MATH4907	Numerio	cal methods for fin	nancial calculus (6 credits)	Academic Ye	ar 2020		
Offering Department	Mathemat	tics	<u> </u>	Quota			
Course Co-ordinator	Dr C W W	Vong, Mathematics (cw	vwongab @hku.hk)				
Teachers Involved	(Dr C W V	Nong,Mathematics)					
Course Objectives		his course aims at providing effective numerical methods as well as their theoretical aspects for solving problems risen from financial derivatives and asset pricing.					
Course Contents	- Introduc	tion to the mathematic	al theory of vanilla and exotic option	ns, both the PDE and the Ma	artingale approach.		
& Topics			Scholes pricing differential equation simulations and their performance		lyses.		
Course Learning	On succe	ssful completion of this	s course, students should be able t	o:			
Outcomes		emonstrate knowledge nancial derivatives	e and understanding of the marting	gale theory in option pricings	s as well as related		
	CLO 2 im	nplement and analyse	various numerical methods on the	Black-Scholes pricing differe	ntial equation		
		nderstand the connecti choles pricing different	ion between the binomial tree meth tial equation	nod and the finite difference i	method of the Black		
	CLO 4 im	nplement and analyse	Monte Carlo simulation methods of	n the martingale pricing form	ula		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	1ATH3906 or equivaler	nt.				
Offer in 2020 - 2021	N Off	fer in 2021 - 2022 : Y		Examination			
Grade Descriptors (A+ to F)	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.						
	В						
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.						
	D						
	Fail	Demonstrate poor and inabeing able to complete the	adequate understanding by not being able	to identify appropriate theorems or	their applications, or not		
Course Type	Lecture-b	ased course					
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures			36			
	Tutorials				12		
	Reading	/ Self study			100		
Assessment Methods and Weighting	Methods	i	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents		10	CLO 1,2,3,4		
	Examination			50	CLO 1,2,3,4		
	Test			40	CLO 1,2,3,4		
Required/recommended reading and online materials	Alison Eth Wilmott, I Financial	J. Strikwerda: Finite Difference Schemes and PDEs (Wadsworth & Brooks, 1989) Alison Etheridge: A Course in Financial Calculus (Cambridge University Press) Wilmott, Dewynne and Howison: Option Pricing: Mathematical Models and Computation (Latest Edition) (Oxf Financial Press) P. Glasserman: Monte Carlo Methods in Financial Engineering (Latest Edition) (Springer-Verlag)					
Course Website	http://moc	odle.hku.hk/		, , <u>.</u>			
Additional Course	Timetable	ttp://moodle.hku.hk/ imetable:					

MATH4910	Senior mathematics seminar (6 credits)	Academic Year	2020			
Offering Department	Mathematics Quota 12					
Course Co-ordinator	Prof K P Ng; Dr T K Wong, Mathematics (mng @maths.hku.hk; takkwong @maths.hku.hk)					
Teachers Involved	(Dr T K Wong,Mathematics) (Prof K P Ng,Mathematics)					
	,					

Course Objectives	articles a	This seminar style capstone course aims to provide students with the experience of intense reading of journal articles and book chapters, followed by group discussions through which knowledge acquisition and synthesis will be attained. Students will look at particular mathematical topics in depth, and will master the topics through				
Course Contents & Topics	reading, listening, discussing and writing. This seminar course may be in the form of research seminar, reading seminar, or a combination of both. Research seminar provides first-hand research experience to students, who will discuss the advancement of knowledge brought about by the readings, and the difficulties they encounter in the research process. Reading seminar involves discussions on arguments delivered by the authors of books or articles, and how convincing the arguments are. Participants will experience the process of argumentation in the construction of knowledge and development of research idea. Student performance is manifested in their preparedness, quality of comments, responsiveness to comments and overall engagement in the seminar. The end product is a research paper or written report and oral presentations. Topics will be chosen by the instructors, including journal articles and book chapters.					
Course Learning Outcomes	CLO 1 ex CLO 2 cr CLO 3 or	xplain and discuss the ritique and argue abo	nis course, students should be able to: e contents of the topics they studied out the ideas and theories of the work they s size the material they have learned, a		in writing using	
Pre-requisites (and Co-requisites and Impermissible combinations)	This caps only. The Pass in MATH4X	Inaurematical language This capstone course is for Mathematics / Mathematics (Intensive), and Mathematics/Physics Majors studer only. The earliest that a student is allowed to take this capstone course is their year 3 study. Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XX MATH4XXX, or MATH7XXX) in the Mathematics/ Mathematics (Intensive), and Mathematics/Physics Majors; a subject to approval by the Department.				
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021	1 - 2022 : Y	Examination	No Exam	
Grade Descriptors (A+ to F)	A Demonstrate an excellent understanding of the material by lucid exposition. Engage constructively by providing insightful analyses and raising critical points in group discussion. Demonstrate clear and critical analysis, coherent synthesis, and effective application of the knowledge through writing and oral presentation using mathematical language. B Demonstrate a good understanding of the material by mostly clear and effective presentation. Engage actively in group discussion most of the time by providing helpful points and asking questions that advance the discussion. Demonstrate mostly clear and effective analysis, synthesis, and application of the knowledge through writing and oral presentation using mathematical language. C Demonstrate a general understanding of the material by moderately effective presentation. Engage in group discussion most of					
	D Fail	the time with some useful input. Demonstrate moderately clear and effective analysis, synthesis, and application of the knowledge through writing and oral presentation using mathematical language. Demonstrate a basic but limited understanding of the material by partially effective presentation. Plays a passive role, or gives limited useful contribution to group discussion. Demonstrate limited or barely effective analysis, synthesis, and application of the knowledge through writing and oral presentation using mathematical language. Fail Demonstrate inadequate understanding of the material by barely effective or ineffective presentation. Little or no participation in and contribution to group discussion. Demonstrate inadequate or ineffective analysis, synthesis, and application of the				
Course Type	Proiect-ba	ased course	ing and oral presentation using mathematical languag	s.		
Course Teaching	Activitie		Details		No. of Hours	
& Learning Activities	Meeting with supervisor		Seminars: Students take turns to give presentations to the whole class; group discussions.		36	
		/ Self study	Reading material and preparation for discussions; writing of reports/researc	h papers.	100	
Assessment Methods and Weighting	Methods	5	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Dissertat	tion	Based on class participation and group discussions.	20	CLO 1,2,3	
	Oral pres	sentation	Seminar presentations.	30	CLO 1,2,3	
	Research report		Written report / research paper: Individual and/or group reports/research papers totally no more than 10,000 words.	50	CLO 1,2,3	
Required/recommended reading and online materials	TBC					
Course Website	http://mod	odle.hku.hk/				
Course website	map.//mod	- a. a				

MATH4911	Mathematics capstone project (6 credits)	Academic Year	2020			
Offering Department	Mathematics	Quota				
Course Co-ordinator	Prof T W Ng, Mathematics (ntw@maths.hku.hk)					
Teachers Involved	(Prof T W Ng,Mathematics)					
Course Objectives	This course aims to provide students an experience of engaging in a project which requires integration and/or application of the mathematical knowledge they have acquired.					
Course Contents & Topics	Students will work collaboratively in small groups on a project under the guidan of this capstone project is on the integration and/or application of mathema students. The project topic is not limited to academic context, but can also corporate outreach project. Projects may take the form of a combination of analysis, creation of artifacts or media contents, exhibition, public lectures, de problem under study, etc. Assessment may take the form of written report, or portfolio, and/or peer evaluation, etc. Topics are either chosen by the supervisand approved by their supervisor(s).	atical knowledge be extended to literature resear velopment of solu al presentation, n	acquired by the a community or ch, survey, data ation plan for the nedia production,			
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 integrate and apply mathematical knowledge they have previously acquired CLO 2 work collaboratively with others CLO 3 communicate their project topic to experts and/or lay audiences through suitable media using appropriate mathematical terms and language					

Pre-requisites (and Co-requisites and Impermissible combinations)	only. This capstone Pass in MATH4X	This capstone course is for Mathematics / Mathematics (Intensive), and Mathematics/Physics Majors students only. This course is for third and fourth year students only. The earliest that a student is allowed to take this capstone course is their year 3 study. Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX, MATH4XXX, or MATH7XXX) in the Mathematics/ Mathematics (Intensive), and Mathematics/Physics Majors; and subject to approval by the Department					
Offer in 2020 - 2021		ject to approval by the Department. Offer in 2021 - 2022 : Y Examination					
Grade Descriptors (A+ to F)	A		creative integration and/or application of the m highly effectively on, the project. Communicate eguage.				
	В	collaborate mostly effective mathematical terms and language		ctively through suitable med	lia using appropriate		
	С		el of integration and/or application of the mathem				
	D		ration on the project. Moderately effective communitegration and/or application of the mathematical l				
			e project. Show limited ability to effectively commu				
	Fail		integration and/or application of the mathemative collaboration on, the project. Communicate ine				
Course Type		ased course					
Course Teaching	Activitie	S	Details		No. of Hours		
& Learning Activities	Meeting with supervisor		Students meet with their supervisor(s or to discuss their progress.	20			
	Assessm	ent	Project work: Students work on their p	roject	130		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Dissertation		Coursework assessment: Based on participation and collaboration throughout the whole project.	20	CLO 1,2,3		
	Oral presentation		Oral presentation components of the project may include seminars, lectures, oral reports, audio recordings, etc.	30	CLO 1,2,3		
	Research report		Written report / media production: This part may include written reports, booklets, exhibition materials, video productions, computer software, etc.	50	CLO 1,2,3		
Required/recommended reading and online materials	TBC						
Course Website	http://moo	odle.hku.hk/					
Additional Course			n procedure are released by email from	m the Department. Son	homore or above		
Information	students applicatio	who have declared Ma n results will be annound report must be submitted	ajor in Mathematics/Mathematics (Intersection in Mathematics) (Intersection in Intersection in	nsive) will receive ema uiry, please contact the	ails in June. The Department.		

MATH4966	Mathemati	cs internship (6 cred	its)		Academic Year	2020	
Offering Department	Mathematics	1			Quota		
Course Co-ordinator	Dr C W Won	Dr C W Wong, Mathematics (internship@maths.hku.hk)					
Teachers Involved	(All teaching	staff,Mathematics)					
Course Objectives	study. The v	his course aims to offer students the opportunities to gain work experience in the industry related to their major o tudy. The workplace learning experience would be of great benefits to the students to apply their knowledge ained in the study to the real work environments. Students have to take on at least 160 hours of internship work either within the University or outside the University arranged by the department.					
Course Contents & Topics	various tasks	thin the university: each student will be supervised by a staff member (supervisor), working on a project or rious tasks as instructed by the supervisor. Itside the university: each student will carry out approved work under the guidance and supervision of an					
Course Learning	On successf	ul completion of this cours	e, students should be	able to:			
Outcomes	CLO 1 gain work experience in an industry related to mathematical sciences						
	CLO 2 have an understanding of how mathematics is used to solve real-world problems						
Pre-requisites (and Co-requisites and Impermissible combinations)	only. The ear Pass in at MATH4XXX,	his capstone course is for Mathematics / Mathematics (Intensive), and Mathematics/Physics Majors students nly. The earliest that a student is allowed to take this capstone course is their year 3 study. ass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX, IATH4XXX, or MATH7XXX) in the Mathematics/ Mathematics (Intensive), and Mathematics/Physics Majors; and ubject to approval by the Department.					
Offer in 2020 - 2021	Y 1st se	m 2nd sem Summer	Offer in 2021 - 2022 :	Υ	Examination	No Exam	
Grade Descriptors (Pass /Pass with distinction /Fail)	Distincti on Demonstrates excellent ability in applying knowledge to solve problems in the workplace. Demonstrates excellent performance in handling and carrying out the work required in the job or assigned by supervisor(s). Establishes highly effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours, with excellent performance in written and oral report and excellent evaluation by supervisor(s), etc.						
	Able to apply knowledge to solve problems in the workplace. Successfully handles and carries out the work required in the job or assigned by supervisor(s). Establishes effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc. Students demonstrating excellent performance in the above would be awarded a grade of "Distinction".						
	Fail Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required in the job or assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other colleagues, or clients in the job. Fails to satisfy the requirements set out in the Course Description regarding working hours, written and oral						

	report, or evaluation by supervisor(s), etc.						
Course Type	Internship						
Course Teaching	Activities	Details		No. of Hours			
& Learning Activities	Internship work		it is expected that students are to work at least 160 hours (or the equivalent of 4 weeks full-time)				
Assessment Methods and Weighting	Methods	Details	Details Weighting in final course grade (%)				
	Written report	written report, employer's feedback and oral presentation	100	CLO 1,2			
Additional Course Information	Satisfactory completion of this course can be counted towards the Capstone requirement. Details of internship will be recorded on the student's transcript. This course will be assessed on "Pass/Fail" basis. Students who are interested to enrol in this course should contact the Department to obtain the approval. Enrolment of this course is not conducted via the online course selection system and should be made through the relevant Department/School office after approval has been obtained from the course coordinator.						

MATH4999	Mathem	atics project (12 cr	redits)	Academic Y	ear 2020		
Offering Department	Mathematics Quota						
Course Co-ordinator	Prof X Yu	Prof X Yuan, Mathematics (xmyuan@hku.hk)					
Teachers Involved	(All teachi	ing staff,Mathematics)					
Course Objectives	The aim o	of the course is to provide	de students with the opportunity to	formulate and to investigat	e, in depth, problem		
			ive a foretaste of mathematical re irable part of the training of a math		lone on an individua		
Course Contents	The subje	ect matter of the project	t will be determined by consultation	on between the student an	d his/her supervisor		
& Topics			m areas of pure and applied math ne prospective supervisor and the				
Course Learning	On succes	ssful completion of this	course, students should be able to	D:			
Outcomes	CLO 1 s	tudy independently and	d in depth an advanced topic that is	s not available in the regula	r curriculum		
	CLO 2 a	nalyze and synthesize	information gathered from differen	t sources			
	CLO 3 a	rticulate their findings a	and conclusions				
	CLO 4 g	ive an exposition of the	eir work in a written report				
Pre-requisites	This caps	tone course is for Ma	thematics / Mathematics (Intensi	ve), and Mathematics/Phys	sics Majors students		
(and Co-requisites	only. The	earliest that a student i	s allowed to take this capstone co	urse is their year 3 study.			
and Impermissible			advanced level disciplinary core		,		
combinations)			the Mathematics/ Mathematics (In	tensive), and Mathematics	/Physics Majors; and		
		approval by the Depar					
Offer in 2020 - 2021		ar long Offer in 2021		Examination			
Grade Descriptors (A+ to F)	A Demonstrate thorough grasp of the subject. Show strong analytical and critical abilities and logical thinking, with evidence of original thought. Insightful use and critical evaluation of information drawn from a broad range of high quality sources and to reference aptly. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.						
	В						
	C Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. Use of relevant information from sources, showing ability to make comparisons between different interpretations and to reference aptly. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.						
	D Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Demonstrate use and reference of several sources, but mainly through summary rather than analysis and comparison. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.						
	Fail Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Limited use of secondary sources and no critical comparison of them. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills and minimally effective or ineffective.						
Course Type	Project-ba	ased course					
Course Teaching	Activities	3	Details		No. of Hours		
& Learning Activities	Reading /	/ Self study	independent work & to attend m	eetings & seminars	240		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Dissertation		Written report plus oral presentation	100	CLO 1,2,3,4		
Additional Course Information	students application The final r	presentation presentation The offered topics and application procedure are released by email from the Department. Sophomore or above tudents who have declared Major in Mathematics/Mathematics (Intensive) will receive emails in June. The application results will be announced in late July or early August. For enquiry, please contact the Department. The final report must be submitted by the end of the 2nd semester. The deadline for submission will be announced in the due course.					

MATH7101	Intermediate complex analysis (6 credits)	Academic Year	2020		
Offering Department	Mathematics	Quota			
Course Co-ordinator	Prof T W Ng; Dr. X Zhang, Mathematics (ntw@maths.hku.hk; xzhang@maths.hl	ku.hk)			
Teachers Involved	(Dr X Zhang,Mathematics) (Prof T W Ng,Mathematics)				
Course Objectives	The objective is to familiarize students with analytic, algebraic and geometric concepts and techniques in the study of Complex Analysis in a single variable beyond an introductory course on functions of a complex variable.				
Course Contents & Topics	 In the course we study meromorphic functions on compact Riemann surface using analytic and algebraic techniques. Topics on meromorphic function meromorphic functions on compact Riemann surfaces, elliptic functions, P Problem and the Weierstrass Problem on compact Riemann surfaces and on op 	ns include the o oincare series, tl	constructions of he Mittag-Leffler		

			orphic functions, sheaf cohomology	theory and cohomology	theories in terms of	
	differential forms will be introduced A choice of other topics may be included. Examples of possible topics include normal families, the Riemann Mapping Theorem, Little Picard Theorem, geometric theory of holomorphic mappings, potential theory in one complex variable, complex dynamics, and special functions.					
Course Learning			ourse, students should be able to:			
Outcomes	fu	ınctions, on elliptic curve:				
	C	ohomological problems, b	l existence problems on meromorph peing able to solve them in certain type	pical cases	•	
	O	n compact Riemann surfa	s in the proofs of various mathematica aces or on plain domains and apply t	hem in solving problems	· ·	
	а	pply them in solving prob				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in a	first course in Complex	Analysis such as MATH3403, and ap	proval by the course coc	ordinator.	
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20)22 : Y	Examination	No Exam	
Grade Descriptors (A+ to F)	A	applications through correct	nderstanding of key concepts and ideas by be ly analysing problems, clearly and elegantly p computations carefully and correctly, and with	presenting correct logical reason	oning and argumentation	
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.					
	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.					
	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but wit substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation with substantial computational errors.				
	Pail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or no being able to complete the solution.					
Course Type		ased course				
Course Teaching	Activitie	S	Details	No. of Hours		
& Learning Activities	Lectures	/ O . If . / .		36		
		/ Self study		100		
Assessment Methods and Weighting	Methods	;	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Test		Written midterm test and written/oral end-of-term 100 CLO assessment		CLO 1,2,3,4	
Required/recommended reading and online materials	R. Narasimhan: Complex Analysis in One Variable (Birkhauser, 2001, 2nd edition) O. Forster: Lectures on Riemann Surfaces (Springer-Verlag, 1981) J.B. Conway: Functions of One Complex Variable I (Springer-Verlag, 1995)					
	K. Chandrasekharan: Elliptic Functions (Springer-Verlag, 1985) K.G. Krantz, Geometric Function Theory (Birkhauser, 2006)					
Course Website	http://mod	odle.hku.hk/				
Additional Course Information	Timetable http://hku		table/timetable2021_S1.pdf			

MATH7201	Topics i	in geometry (6 credits) Academic Year	2020				
Offering Department	Mathemat	tics Quota					
Course Co-ordinator	TBC, Matl	hematics ()					
Teachers Involved							
Course Objectives		se introduces to students a main area of differential geometry beyond the notion of mof differential forms and prepares them to study further and to do research in geometry.	nanifolds and the				
Course Contents & Topics	following: (i) Riemal and Dirac (ii) Symplogroup acti (iii) Vector	The topic varies according to the year and the instructor. For example, it can be one of (but not restricted to) the llowing: Riemannian geometry: affine and Levi-Civita connection, Riemann curvature tensor, spinor bundles, Laplace and Dirac operators, harmonic forms and spinors, applications in relativity; Symplectic geometry: symplectic vector spaces, symplectic manifolds, Lagrangian submanifolds, Hamiltonian oup actions, moment maps, symplectic quotients, convexity theorems, localization; Vector bundles: vector bundles, connection and curvature, characteristic forms and classes, superconnections, ansgression, topological K-theory, introduction to index theory.					
Course Learning Outcomes	CLO 1 ha	ssful completion of this course, students should be able to: ave a working knowledge of the calculus of differential forms beyond the level of MATH3 nderstand the keys points of the particular subject chosen and be ready to learn other top					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in (N	Pass in (MATH4402 or MATH4501) and (MATH4511 or the approval of the course coordinator)					
Offer in 2020 - 2021	N Off	fer in 2021 - 2022 : N Examination					
Grade Descriptors (A+ to F)	Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and thei applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.						
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.						
	С	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify a but with some inadequacies in applying the theorems through incorrectly analysing problems with presentation or a number of minor computational errors.					
	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriat	e theorems, but with				

		substantial inadequa		gh incorrectly analysing problems with poor arg	gument or presentation or
	Fail	Demonstrate poor a being able to comple		being able to identify appropriate theorems or	their applications, or not
Course Type	Lecture-b	ased course			
Course Teaching	Activitie	s	Details		No. of Hours
& Learning Activities	Lectures				36
	Reading / Self study				100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments			50	CLO 1,2
	Examination			50	CLO 1,2
Required/recommended reading and online materials	TBC				

MATH7202	Comple	x manifolds (6 cre	dits)	Academic Ye	ar 2020	
Offering Department	Mathemat	Mathematics Quota				
Course Co-ordinator		k, Mathematics (nmok	(@hku.hk)			
Teachers Involved		ok,Mathematics)				
Course Objectives			e foundation of the theory of compleing on compact complex manifolds.	ex manifolds and to intro	duce students to a	
Course Contents & Topics	cohomolo vector bui - It proce manifolds decompos - The coi manifolds (i) Siegel's (ii) geome	This course contains an introductory part on basic notions on complex manifolds including sheaf cohomology obnomology theories in terms of differential forms, Hermitian and Kahler manifolds, and Hermitian holomorphic ector bundles. It proceeds to introduce the theory of harmonic forms, establishing fundamental results on compact complet anifolds including Serre duality, the Kodaira Vanishing Theorem, the Kodaira Embedding Theorem and Hodge ecomposition on compact Kahler manifolds. The course concludes with a choice of topics on analytic and geometric aspects of the theory of completanifolds. Examples of such topics include Siegel's Theorem on the field of meromorphic functions on a compact complex manifold; geometry of compact quotients of bounded symmetric domains and Hermitian symmetric manifolds; an introduction to the deformation theory of compact complex submanifolds in a complex manifold.				
Course Learning	On succe	ssful completion of this	course, students should be able to:			
Outcomes	gl m CLO 2 gr m	obal holomorphic sect anifolds asp the relationship bake use of the relatio	omorphic line bundles, understand va tions of line bundles, and to relate the between sheaf cohomology, de Rhar inship to solve various existence pro	nem to the embedding of m cohomology and d-bal	f compact complex cohomology, and	
Pro requisites	CLO 3 gr m of CLO 4 id ar	harmonic forms CLO 3 grasp the basics of complex differential geometry such as notions of connections and curvature on Kahler manifolds and on Hermitian holomorphic vector bundles, and be able to relate various notions of positivity of curvature and apply them to vanishing and embedding theorems CLO 4 identify the key elements in the theoretical foundation of various additional topics covered in the course and to make use of them in solving problems				
Pre-requisites (and Co-requisites and Impermissible combinations)		ATH3403 or MATH450				
Offer in 2020 - 2021		l sem Offer in 2021 -		Examination	No Exam	
Grade Descriptors (A+ to F)	B C	applications through corre and being able to carry ou Demonstrate a good und applications through corre theorems or their applicat Demonstrate an acceptal but with some inadequa	t understanding of key concepts and ideas by bactly analysing problems, clearly and elegantly to computations carefully and correctly, and with lerstanding of key concepts and ideas by being the analysing problems, but with some minor compole understanding of key concepts and ideas bacies in applying the theorems through inco of minor computational errors.	presenting correct logical reasons ome innovative approaches to a able to identify the appropriate inadequacies in arguments, identificational errors. y being able to correctly identifications.	oning and argumentation o solving problems. iate theorems and their entifying the appropriate by appropriate theorems,	
	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but wit substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation with substantial computational errors.				
	Fail	Demonstrate poor and ina being able to complete the	adequate understanding by not being able to id e solution.	entity appropriate theorems or	their applications, or not	
Course Type	Lecture-b	ased course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Reading	Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Test		Written midterm test and written/oral end-of-term assessment	100	CLO 1,2,3,4	
Required/recommended reading and online materials	Publishers K. Kodair Wissensc	 Griffiths & J. Harris: Principles of Algebraic Geometry, Pure and Applied Mathematics (Wiley-Interscience Publishers, New York 1978) Kodaira: Complex Manifolds and Deformation of Complex Structures (Grundlehren der mathematischen Vissenschaften 283, Springer-Verlag, Berlin-Heidelberg 1986) Mok: Metric Rigidity Theorems on Hermitian Locally Symmetric Manifolds (World Scientific, Singapore-New 				
Course Website		dle.hku.hk/				
Additional Course	Timetable					

MATH7217	Topics i	n financial mathem	natics (6 credits)		Academic Year	2020	
Offering Department	Mathemat	ics			Quota		
Course Co-ordinator	TBC, Mathematics ()						
Teachers Involved		.,					
Course Objectives			ng students to funda ng students to research				
Course Contents & Topics	- Interest in - Mathematic - Estimatic	- Investment models and portfolio theory Interest rate modeling Mathematics of financial derivatives, pricing and hedging Estimation and modeling of volatilities Risk measures and risk management.					
Course Learning	On succes	ssful completion of this	course, students should	be able to:			
Outcomes	CLO 1 ur	nderstand and be able t	o utilize various models	and results in investme	ent and interest ra	ite	
	CLO 2 gr	asp the methodology in	n derivative pricings and	the modeling of volatili	ties		
	CLO 3 ur		to utilize the concept of			bject to the topics	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in a	Pass in an advanced level mathematics courses (MATH3XXX, MATH4XXX, or MATH7XXX) and subject to the approval of the course coordinator.					
Offer in 2020 - 2021	N Off	er in 2021 - 2022 : N			Examination		
Grade Descriptors (A+ to F)	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.						
	В	Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.					
	С	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.					
	D	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation of with substantial computational errors.					
	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or no being able to complete the solution.					eir applications, or not	
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	3	Details			No. of Hours	
& Learning Activities	Lectures					36	
	Reading /	Self study				100	
Assessment Methods and Weighting	Methods		Details		nting in final se grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents			50	CLO 1,2,3	
	Examinat				50	CLO 1,2,3	
Required/recommended reading and online materials	TBC						

MATH7219	Topics i	n applied functional analysis (6 credits)	Academic Year	2020		
Offering Department	Mathema	tics	Quota			
Course Co-ordinator	TBC, Mat	hematics ()				
Teachers Involved						
Course Objectives	introducin	graduate to advanced undergraduate university level course of good to students the basic knowledge of using functionatics. This course would lay a foundation for students in studyi	l analysis on various á	pplied topics in		
Course Contents & Topics	 Generalized functions (also called distributions), delta function, generalized Fourier Transform. Applicati differential equations, Fundamental solution, Green's function. Sobolev spaces, Sobolev Embedding Theorem, Trace. Hilbert space linear operator theory (bounded operators, compact operators, closed unbounded operaspectral theory. Applications to differential equations (infinitesimal generator, semigroup of linear operators). Applications to optimization problems. Wherever needed, we shall also review techniques for Metric spaces (Category Theorem), Banach spaces Banach Theorem, Opening Mapping Theorem, Closed Graph Theorem and Uniform Boundedness Principl Hilbert spaces (Orthogonality and best approximation, Fourier isometry). 					
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 apply generalized functions and their Fourier transform to practical problems					
	CLO 2 understand Sobolev spaces and how to apply them in the process of solving differential equations					
	CLO 3 understand Hilbert space linear operator theory and apply it in solving differential equations					
	CLO 4 apply these results to optimization problems					
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in MATH3401 and MATH4404, or approval of the course coordinator.				
Offer in 2020 - 2021	N Off	er in 2021 - 2022 : N	Examination			
Grade Descriptors (A+ to F)	A	Demonstrate an excellent understanding of key concepts and ideas by be applications through correctly analysing problems, clearly and elegantly pand being able to carry out computations carefully and correctly, and with	presenting correct logical reasoning	ng and argumentation		
	В	Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their				

Required/recommended reading and	Examination TBC			50	CLO 1,2,3,4		
	Assignme	ents		50	CLO 1,2,3,4		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Reading / Self study				100		
& Learning Activities	Lectures						
Course Teaching	Activities		Details	No. of Hours			
Course Type	Lecture-ba	ased course					
	Fail		Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applica being able to complete the solution.				
	D	substantial inadequacies in with substantial computation	ideas by being able to correctly identify appro igh incorrectly analysing problems with poor arg	jument or presentation or			
	С	but with some inadequad presentation or a number of	cies in applying the theorem of minor computational errors.		ith poor argument and		
		theorems or their application	ons and presentation or with s	with some minor inadequacies in arguments, io ome minor computational errors.	, , , , , ,		

MATH7224	Topics in	n advanced probab	oility theory (6 credits)		Academic Yea	r 2020		
Offering Department	Mathemati	cs			Quota			
Course Co-ordinator	TBC, Math	ematics ()						
Teachers Involved								
Course Objectives	undergrad	nis course aims at introducing fundamental knowledge in probability theory to graduate students and senion adergraduate students. It can help preparing these students for advanced research in probability theory and its ide-range applications.						
Course Contents & Topics		heory, law of large nur Brownian motion.	mbers, central limit theorems	, random walks, m	nartingales, Marl	ov chains, ergodi		
Course Learning	On succes	sful completion of this	course, students should be a	ble to:				
Outcomes	CLO 1 de	monstrate in-depth und	derstanding of basic concepts	and terminologies	s in probability th	neory		
			ne fundamental theorems fo abject to the topics chosen that		solving in theor	y or practice, the		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	ass in MATH3603 and MATH4402, and approval of the course coordinator.						
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : N			Examination			
Grade Descriptors (A+ to F)	Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.							
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.							
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.							
	D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.							
	Fail Demonstrates poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.							
Course Type	Lecture-ba	sed course						
Course Teaching	Activities		Details			No. of Hours		
& Learning Activities	Lectures					36		
	Reading /	Self study				100		
Assessment Methods and Weighting	Methods		Details		ting in final e grade (%)	Assessment Methods to CLO Mapping		
	Assignme	nts			50	CLO 1,2		
	Examinati	on			50	CLO 1,2		
Required/recommended reading and online materials		ett: Probability: Theory e University Press, 201	and Examples, Cambridge 10, 4th edition)	Series in Statisti	cal and Probab	ilistic Mathematics		
Course Website	http://moor	dle.hku.hk/						
	p./////	aio.iiiv						

MATH7501	Topics i	algebra (6 cred	ts)		Academic Year	2020
Offering Department	Mathemat	thematics Quota				
Course Co-ordinator	Dr Z Hua,	Mathematics (huazh	eng @maths.hku.hk)			
Teachers Involved	(Dr Z Hua	Mathematics)				
Course Objectives	To provid depth.	students specializi	ng in mathematics with th	ne opportunity to study	some topics in a	lgebra in greater
Course Contents & Topics	forms; mu	tilinear algebra; alge	ics in algebra such as grebraic number theory; gro geometry. Topics may va	oup representations; co		
Course Learning	On succes	sful completion of th	s course, students should	be able to:		
Outcomes	CLO 1	acquire knowledge	in the covered topics to co	onsiderable depth		
	CLO 2	if he/she wishes, pu	irsue more advanced stud	dies in areas of algebra		
Pre-requisites	Pass in M	ATH4302				

(and Co-requisites and Impermissible							
combinations) Offer in 2020 - 2021	N Off	er in 2021 - 2022 : Y		Examination			
Grade Descriptors (A+ to F)	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.						
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.						
	С		understanding of key concepts and ideas by es in applying the theorems through incor minor computational errors.				
	D		anding of key concepts and ideas by being a applying the theorems through incorrectly and all errors.				
	Fail	Demonstrate poor and inad being able to complete the s	equate understanding by not being able to ide solution.	entify appropriate theorems or	their applications, or not		
Course Type	Lecture-ba	ased course					
Course Teaching	Activities		Details	No. of Hours			
& Learning Activities	Lectures			36			
	Reading	Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	coursework assessments (may include presentations)	50	CLO 1,2		
	Examinat	ion	One 1.5-hour written examination	50	CLO 1,2		
Required/recommended reading and online materials	To be dec	ided by the course instru	uctor.				
Course Website	http://moo	dle.hku.hk/					
Additional Course	Timetable	•					
Information	http://hkur	math.hku.hk/~math/Time	table/timetable2021_S1.pdf				

MATH7502	Topics i	in applied discrete	e mathematics (6 credits)	Academic Ye	ar 2020		
Offering Department	Mathema	tics		Quota			
Course Co-ordinator	Prof W Za	ang, Mathematics (wz	ang@maths.hku.hk)				
Teachers Involved	(Prof W Zang,Mathematics)						
Course Objectives	This is a follow-up of the course MATH3600. It introduces students to some powerful linear algebra and probabilistic methods that have been used with striking success in discrete mathematics, and covers some of the most fundamental and beautiful results obtained by these methods.						
Course Contents & Topics	2. Probat	 Linear algebra method: rank argument, eigenvalue technique, polynomial technique, general position method. Probabilistic method: basic method, linearity of expectation, deletion method, Lov\'asz local lemma, second moment method. Additional techniques if time permits. 					
Course Learning			s course, students should be able to:				
Outcomes	CLO 1 d	lemonstrate knowledg	e and understanding of some research	areas of applied discrete	mathematics		
	CLO 2 s	olve various discrete	mathematics problems using linear alge	bra and probabilistic met	hods		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in (N	MATH3301 or MATH3	600), and approval of the course coordi	nator.			
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021	- 2022 : N	Examination	May		
Grade Descriptors (A+ to F)	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.						
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.						
	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.						
	D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation or with substantial computational errors.						
	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.						
	Lecture-based course						
Course Teaching	Activitie	s	Details		No. of Hours		
Course Teaching	Activities Lectures	s	Details		36		
Course Teaching & Learning Activities	Activities Lectures	s	Details				
Course Teaching & Learning Activities Assessment Methods	Activities Lectures	s / Self study	Details Details	Weighting in final course grade (%)	36		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Reading	s / Self study			36 100 Assessment Methods		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Reading Methods	s / Self study i	Details	course grade (%)	36 100 Assessment Methods to CLO Mapping		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Activities Lectures Reading Methods Assignment	s / Self study i	Details coursework assessment	course grade (%)	36 100 Assessment Methods to CLO Mapping CLO 1,2		
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials Course Website	Activities Lectures Reading Methods Assignme Examina Instructor	s / Self study s ents tion	Details coursework assessment	course grade (%)	36 100 Assessment Methods to CLO Mapping CLO 1,2		

MATH7503	Topics in credits)	ar 2020						
Offering Department	Mathemat	ics		Quota				
Course Co-ordinator	Prof X Yu	an, Mathematics (xn	nyuan @hku.hk)					
Teachers Involved	(Prof X Yu	ian,Mathematics)	•					
Course Objectives	To learn a	To learn a selection of advanced and up-to-date topics in mathematical programming and continuous optimization, including theory, numerical algorithms and applications.						
Course Contents & Topics	Topics ma	y include convex pr	ogramming, nonconvex programming, si all monotone operator, optimization theo	tochastic programing, sa ory and algorithms suitab	ddle point problems le for applications ir			
		various areas such as machine learning, artificial intelligence, imaging and computer vision. The selection may vary from year to year.						
Course Learning	On succes	ssful completion of the	nis course, students should be able to:					
Outcomes	ор	timization approach	nced concept and approach of the ness as appropriate in Scientific Computing	g, Operations Research,	Data Science, etc			
			ge and understanding of the underlyi ithms plus their extensions	ng theory and techniqu	ies of the various			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M.	ATH3901, MATH390	04 and (MATH4902 or the approval of th	e course coordinator)				
Offer in 2020 - 2021	Y 2nd	sem Offer in 202	1 - 2022 : Y	Examination	No Exam			
Grade Descriptors (A+ to F)	A	applications through co	ent understanding of key concepts and ideas by prectly analysing problems, clearly and elegantly out computations carefully and correctly, and to so	presenting correct logical reason	oning and argumentation			
	B Demonstrate a good understanding of key concepts and ideas by being able to identify appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.							
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with poor argument and							
			quacies in applying the theorems through inco					
	D	presentation or a numb Demonstrate some und substantial inadequacie	quacies in applying the theorems through inco er of minor computational errors. derstanding of key concepts and ideas by being a se in applying the theorems through incorrectly an	rrectly analysing problems with	th poor argument and priate theorems, but with			
	D Fail	presentation or a numb Demonstrate some und substantial inadequacie with substantial comput Demonstrate poor and	quacies in applying the theorems through incoler of minor computational errors. derstanding of key concepts and ideas by being a ses in applying the theorems through incorrectly and tational errors. inadequate understanding by not being able to id	rrectly analysing problems wi able to correctly identify appropalysing problems with poor arg	ith poor argument and priate theorems, but with ument or presentation or			
Course Type	Fail	presentation or a numb Demonstrate some und substantial inadequacie with substantial comput Demonstrate poor and being able to complete	quacies in applying the theorems through incoler of minor computational errors. derstanding of key concepts and ideas by being a ses in applying the theorems through incorrectly and tational errors. inadequate understanding by not being able to id	rrectly analysing problems wi able to correctly identify appropalysing problems with poor arg	ith poor argument and priate theorems, but with ument or presentation or			
	Fail Lecture-ba	presentation or a numb Demonstrate some und substantial inadequacie with substantial comput Demonstrate poor and being able to complete ased course	puacies in applying the theorems through incoler of minor computational errors. derstanding of key concepts and ideas by being also in applying the theorems through incorrectly anatational errors. inadequate understanding by not being able to id the solution.	rrectly analysing problems wi able to correctly identify appropalysing problems with poor arg	ith poor argument and oriate theorems, but with ument or presentation or their applications, or not			
Course Teaching	Fail Lecture-ba	presentation or a numb Demonstrate some und substantial inadequacie with substantial comput Demonstrate poor and being able to complete ased course	quacies in applying the theorems through incoler of minor computational errors. derstanding of key concepts and ideas by being a ses in applying the theorems through incorrectly and tational errors. inadequate understanding by not being able to id	rrectly analysing problems wi able to correctly identify appropalysing problems with poor arg	ith poor argument and oriate theorems, but with ument or presentation or their applications, or not No. of Hours			
Course Teaching	Fail Lecture-ba Activities Lectures	presentation or a numb Demonstrate some un substantial inadequacie with substantial compul Demonstrate poor and being able to complete ased course	quacies in applying the theorems through incoler of minor computational errors. Jerstanding of key concepts and ideas by being a sin applying the theorems through incorrectly antational errors. Inadequate understanding by not being able to id the solution. Details	rrectly analysing problems wi able to correctly identify appropalysing problems with poor arg	th poor argument and oriate theorems, but with ument or presentation of their applications, or not No. of Hours 36			
Course Type Course Teaching & Learning Activities	Fail Lecture-ba Activities Lectures Reading /	presentation or a numb Demonstrate some und substantial inadequacie with substantial comput Demonstrate poor and being able to complete ased course	quacies in applying the theorems through incoler of minor computational errors. Justice of the concepts and ideas by being a sin applying the theorems through incorrectly antational errors. Inadequate understanding by not being able to id the solution. Details include presentations	rrectly analysing problems wi able to correctly identify approp alysing problems with poor arg entify appropriate theorems or	ith poor argument and oriate theorems, but with ument or presentation of their applications, or not their applications, or hold their applications of Hours 36 100			
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures	presentation or a numb Demonstrate some un substantial inadequacie with substantial compul Demonstrate poor and being able to complete ased course	quacies in applying the theorems through incoler of minor computational errors. Jerstanding of key concepts and ideas by being a sin applying the theorems through incorrectly antational errors. Inadequate understanding by not being able to id the solution. Details	rrectly analysing problems wi able to correctly identify appropalysing problems with poor arg	th poor argument and oriate theorems, but with ument or presentation of their applications, or not No. of Hours 36			
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Reading /	presentation or a numb Demonstrate some unc substantial inadequacie with substantial compui Demonstrate poor and being able to complete ased course S Self study	quacies in applying the theorems through incoler of minor computational errors. Justice of the concepts and ideas by being a sin applying the theorems through incorrectly antational errors. Inadequate understanding by not being able to id the solution. Details include presentations	rrectly analysing problems with able to correctly identify appropalysing problems with poor argumentify appropriate theorems or weighting in final	ith poor argument and briate theorems, but with ument or presentation or their applications, or not their applications, or not 100 No. of Hours 36 100 Assessment Methods			
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Reading / Methods	presentation or a numb Demonstrate some unc substantial inadequacie with substantial compui Demonstrate poor and being able to complete ased course S Self study	quacies in applying the theorems through incomer of minor computational errors. derstanding of key concepts and ideas by being assin applying the theorems through incorrectly antational errors. inadequate understanding by not being able to id the solution. Details include presentations Details	rrectly analysing problems will able to correctly identify appropalysing problems with poor argumentify appropriate theorems or weighting in final course grade (%)	ith poor argument and briate theorems, but with ument or presentation of their applications, or not their applications, or not 100 Months 100 M			
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Reading / Methods Assignme	presentation or a numb Demonstrate some unc substantial inadequacie with substantial compul Demonstrate poor and being able to complete ased course Self study	quacies in applying the theorems through incomer of minor computational errors. derstanding of key concepts and ideas by being assin applying the theorems through incorrectly antational errors. inadequate understanding by not being able to id the solution. Details include presentations Details One assignment	rrectly analysing problems will able to correctly identify appropalysing problems with poor argumentify appropriate theorems or weighting in final course grade (%)	ith poor argument and briate theorems, but with ument or presentation of their applications, or not their applications, or not 36 100 Assessment Methods to CLO Mapping CLO 1,2 CLO 1,2			
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Reading / Methods Assignme Essay Presentat	presentation or a numb Demonstrate some un substantial inadequacie with substantial comput Demonstrate poor and being able to complete ased course Self study	puacies in applying the theorems through incoler of minor computational errors. derivational groups of key concepts and ideas by being a sin applying the theorems through incorrectly antational errors. inadequate understanding by not being able to id the solution. Details include presentations Details One assignment Two essays Oral Presentation	weighting in final course grade (%)	ith poor argument and oriate theorems, but with ument or presentation of their applications, or not th			
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Reading / Methods Assignme Essay Presentat Project re	presentation or a numb Demonstrate some un substantial inadequacie with substantial comput Demonstrate poor and being able to complete ased course Self study	puacies in applying the theorems through incoler of minor computational errors. derstanding of key concepts and ideas by being also in applying the theorems through incorrectly antational errors. inadequate understanding by not being able to id the solution. Details include presentations Details One assignment Two essays Oral Presentation Research Project Report	weighting in final course grade (%) Weighting in final course grade (%) 10 20 20 30	ith poor argument and oriate theorems, but with ument or presentation of their applications, or not th			
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Fail Lecture-ba Activities Lectures Reading / Methods Assignme Essay Presentat Project re Test Stephen E Jorge Noo Dimitri P. Scientific, M.S. Baza R. Tyrrell I H.H. Baus New York,	presentation or a numb Demonstrate some und Demonstrate some und substantial inadequacie with substantial comput Demonstrate poor and being able to complete assed course Self study Pents Boyd and Lieven Var Bedal and Stephen J Bertsekas, Angelia 2003) Braa and C.M. Shetty Rockafellar: Convex Brocked and P.L. Comi Comit, 2nd edition, 2017)	puacies in applying the theorems through incoler of minor computational errors. derstanding of key concepts and ideas by being a sin applying the theorems through incorrectly and talonal errors. inadequate understanding by not being able to id the solution. Details include presentations Details One assignment Two essays Oral Presentation Research Project Report One written midterm indenberghe: Convex Optimization (Camb. Wright: Numerical Optimization (Spring a Nedic and Asuman E. Ozdaglar: Cor. Nonlinear Programming (John Wiley & Analysis (Princeton University Press, 18) bettes: Convex Analysis and Monotone (Spring a Nedic Scrive).	Weighting in final course grade (%) Weighting in final course grade (%) 10 20 20 30 20 oridge University Press, 2 er, 2010) convex Analysis and Operator Theory in Hilbe	ith poor argument and briate theorems, but with ument or presentation of their applications, or not th			
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Fail Lecture-ba Activities Lectures Reading / Methods Assignme Essay Presentat Project re Test Stephen B Jorge Noo Dimitri P. Scientific, M.S. Baza R. Tyrrell I H.H. Baus New York, A. Beck: F	presentation or a numb Demonstrate some und Demonstrate some und substantial inadequacie with substantial comput Demonstrate poor and being able to complete assed course Self study Pents Boyd and Lieven Var Bedal and Stephen J Bertsekas, Angelia 2003) Bertsekas, Angelia 2003) Bertsekas, Angelia 2003) Bertsekas, Angelia 2013 Bertsekas, Angelia 2014 Bertsekas, Angelia 2014 Bertsekas, Angelia 2015 Bertsekas, An	puacies in applying the theorems through incoler of minor computational errors. destratanding of key concepts and ideas by being a sin applying the theorems through incorrectly antational errors. inadequate understanding by not being able to id the solution. Details include presentations Details One assignment Two essays Oral Presentation Research Project Report One written midterm indenberghe: Convex Optimization (Camb. Wright: Numerical Optimization (Spring a Nedic and Asuman E. Ozdaglar: C. V. Nonlinear Programming (John Wiley & Analysis (Princeton University Press, 15)	Weighting in final course grade (%) Weighting in final course grade (%) 10 20 20 30 20 oridge University Press, 2 er, 2010) convex Analysis and Operator Theory in Hilbe	ith poor argument and briate theorems, but with ument or presentation of their applications, or not th			
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Fail Lecture-ba Activities Lectures Reading / Methods Assignme Essay Presentat Project re Test Stephen B Jorge Noo Dimitri P. Scientific, M.S. Baza R. Tyrrell I H.H. Baus New York, A. Beck: F	presentation or a numb Demonstrate some und Substantial inadequacie with substantial comput Demonstrate poor and being able to complete ased course Service of the substantial comput Bertsels of the substantial comput Bertsels of the substantial comput Bertsels of the substantial comput Bertsekas, Angelia 2003) Bertsekas, Angelia 2004 Bertsekas, Angelia 2004 Bertsekas, Angelia 2006 Bertsekas, Angelia 2007 Bertsekas, Angelia 2008	puacies in applying the theorems through incoler of minor computational errors. derstanding of key concepts and ideas by being a sin applying the theorems through incorrectly and talonal errors. inadequate understanding by not being able to id the solution. Details include presentations Details One assignment Two essays Oral Presentation Research Project Report One written midterm indenberghe: Convex Optimization (Camb. Wright: Numerical Optimization (Spring a Nedic and Asuman E. Ozdaglar: Cor. Nonlinear Programming (John Wiley & Analysis (Princeton University Press, 18) bettes: Convex Analysis and Monotone (Spring a Nedic Scrive).	Weighting in final course grade (%) Weighting in final course grade (%) 10 20 20 30 20 oridge University Press, 2 er, 2010) convex Analysis and Operator Theory in Hilbe	ith poor argument and priate theorems, but with ument or presentation of their applications, or no their applications, or no No. of Hours 36 100 Assessment Methods to CLO Mapping CLO 1,2 CL			

MATH7504	Geometi	c topology (6 credits)		Academic Year	2020
Offering Department	Mathemat	es s		Quota	
Course Co-ordinator	TBC, Math	ematics ()			
Teachers Involved					
Course Objectives		gives a geometric introduction to some of the ne geometric motivations and applications of the	•	opology. The emp	hasis throughout
Course Contents & Topics		. Compactness. Connectedness. The fundame applications of simplicial homology. Theory of	0 1		
Course Learning	On succes	sful completion of this course, students should	be able to:		
Outcomes		lerstand basic ideas and constructions which a n many applications in algebraic topology	are important both in pu	rsuing the deepe	theories as well
		erstand the ideas of attaching space, comp nifolds	lexes, lifting and exter	nsion properties,	and surgery on
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	TH3301 and MATH3401			
Offer in 2020 - 2021	N Offe	in 2021 - 2022 : N		Examination	
Grade Descriptors (A+ to F)	A	Demonstrate an excellent understanding of key concepts applications through correctly analysing problems, clearly and being able to carry out computations carefully and co	and elegantly presenting co	orrect logical reasonin	g and argumentation

	В	applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.					
	С						
	D		anding of key concepts and ideas by being applying the theorems through incorrectly ar nal errors.				
	Fail	Demonstrate poor and inad being able to complete the	equate understanding by not being able to ideological colors.	dentify appropriate theorems or	their applications, or not		
Course Type	Lecture-based course						
Course Teaching	Activities		Details	No. of Hours			
& Learning Activities	Lectures			36			
	Reading / Self study				100		
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm	ients	coursework assessment	50	CLO 1,2		
	Examina	ation	One 2.5-hour written examination	50	CLO 1,2		
Required/recommended reading and online materials		nstrong: Basic Topology (n: An Introduction to Alge	Springer-Verlag UTM) ebraic Topology (Springer-Verlag GT	⁻ M)			

MATH7505	Real an	alysis (6 credits)		Academic Y	ear 2020		
Offering Department	Mathema	tics		Quota			
Course Co-ordinator	Prof W S	Cheung, Mathematics (wscheung@hku.hk)				
Teachers Involved	(Prof W S	Cheung, Mathematics)	,				
Course Objectives		, , , , , , , , , , , , , , , , , , ,	uce the basic ideas and te	chniques of measure theory and th	e Lebesque integral		
Course Contents & Topics	- The Leb - Differen - The L^p - Genera	 Lebesgue Measure on R: Measurable Sets and Lebesgue Measure, Measurable Functions. The Lebesgue Integral: The Lebesgue Integral, Modes of Convergence, Convergence Theorems. Differentiation and Integration: Functions of Bounded Variation, Differentiation of an Integral, Absolute Continuity. The L^p Spaces: The L^p spaces, Convergence and Completeness, Bounded Linear Functionals. General Theory: Measurable Spaces, Measurable Functions, Integration, Convergence Theorems, Radon-Nikodym Theorem. 					
Course Learning			course, students should be	e able to:			
Outcomes	CLO 1 d		s of Lebesgue measure	and measurable functions and un	derstand and apply		
	in	ntegration theories besid	es Riemann's	properties and appreciate the exis	tence of other usefu		
		nderstand the basic prop					
Pre-requisites (and Co-requisites and Impermissible combinations)	A good g	rade in MA I H3401 and	approval by the course co	ordinator			
Offer in 2020 - 2021	Y 2n	d sem Offer in 2021 - 2	2022 : Y	Examination	May		
Grade Descriptors (A+ to F)	A Demonstrate a thorough understanding of all concepts and ideas by being able to draw complex connections among various concepts and apply the theorems through correctly analysing problems, clearly and elegantly presenting correct logical reasoning and argumentation, and with some innovative approaches to solving problems.						
	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing problems, but with some minor inadequacies in arguments, reasoning, identifying the appropriate theorems, applications, or presentation.						
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with acceptable argument and presentation.						
	D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analysing problems with poor argument or presentation.						
	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, and not being able to complete the solution.						
Course Type	Lecture-b	pased course					
Course Teaching	Activitie		Details		No. of Hours		
& Learning Activities	Lectures	-		36			
					12		
-	LUTORIAIS						
-	Tutorials Reading				72		
Assessment Methods		/ Self study	Details	Weighting in final course grade (%)			
Assessment Methods	Reading	/ Self study	Details		72 Assessment Methods		
Assessment Methods	Reading Methods	/ Self study	Details	course grade (%)	72 Assessment Methods to CLO Mapping		
Assessment Methods	Reading Methods Assignm	/ Self study s ents	Details	course grade (%)	72 Assessment Methods to CLO Mapping CLO 1,2,3		
Assessment Methods	Reading Methods Assignm Essay	/ Self study s ents	Details	course grade (%) 10 15	72 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3		
Assessment Methods and Weighting Required/recommended reading and	Reading Methods Assignm Essay Examina Test H.L. Royo	/ Self study s ents tion	rson)	course grade (%) 10 15 50	72 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3 CLO 1,2,3		
Assessment Methods and Weighting Required/recommended reading and online materials Course Website	Reading Methods Assignm Essay Examina Test H.L. Royo W. Rudin	/ Self study s ents tion den: Real Analysis (Peal	rson)	course grade (%) 10 15 50	72 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3 CLO 1,2,3		

PHYS1000	Introdu	ction to astronom	y (6 credits)	Academic Yea	r 2020		
Offering Department	Physics			Quota			
Course Co-ordinator	Dr K M Le	ee, Physics <i>(kmlee</i> @/	lily.physics.hku.hk)				
Teachers Involved	(Dr K M L	.ee,Physics)					
Course Objectives	This is an introductory course on astronomy, including both the observational aspect of the field and a descriptive survey of the solar system, the Sun, stars, galaxies and the universe. Selected special topics such as neutron stars, black holes and dark matter will also be included.						
Course Contents & Topics	our solar provides	Topics covered include the observational aspect of astronomy (including constellations and planets), the physics o our solar system, and our own Sun, stars and their evolution, galaxies, black holes, and cosmology. It also provides students with a basic understanding of the relationship of the science of astronomy to life, and how our nature works on the macroscopic level.					
Course Learning Outcomes	CLO 1 id	lentify and describe alaxies), and explain	is course, students should be able the major objects in our Solar their main properties e model to describe the apparent	System and our universe (inc	cluding stars and		
			of the world-view from the geod sion of the universe on our world-		c model and the		
	u p	niversal gravitation, É roblems	rsical laws, including Kepler's the Doppler shift formula and Hubble	's law to calculate and solve si			
		•	f stars and the evolution of the un				
	CLO 6 communicate astronomical problems and solutions using appropriate astronomical terminology and good English						
Pre-requisites (and Co-requisites and Impermissible combinations)	Nil						
Offer in 2020 - 2021	N Of	fer in 2021 - 2022 : N		Examination			
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-b	ased course					
Course Teaching	Activitie	S	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				6		
	Reading	/ Self study			78		
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm	ents		50	CLO 1,2,3,4,5,6		
	Examina	tion	2-hour written exam	50	CLO 1,2,3,4,5,6		
Required/recommended reading and online materials	E. Chaiss	son and S. McMillan: A	Astronomy Today (Pearson, 2011)	·		
Course Website	http://mod	odle.hku.hk					

PHYS1001	University physics (6 cred	dits)	Academic Year	2020			
Offering Department	Physics		Quota				
Course Co-ordinator	Dr F K Chow, Physics (judycho	w @hku.hk)					
Teachers Involved	(Dr F K Chow,Physics)						
Course Objectives	This is an introductory, calculus the university level.	s-based physics course for the students who wan	t to have an over	view in physics at			
Course Contents & Topics		ion, oscillations, waves and sound, heat and s. Conceptual ideas in physics are emphasized					
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 describe and explain the fundamental physical principles						
	CLO 2 apply these principles, together with logical and mathematical reasoning, to situations of the physical world						
	CLO 3 analyse and solve problems with the aids of mathematics						
	CLO 4 acquire and interpret ex	operimental data to examine the physical laws					
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL						
Offer in 2020 - 2021	N Offer in 2021 - 2022 : N		Examination				
Grade Descriptors (A+ to F)	learning outcomes. Show to apply knowledge to a	mastery at an advanced level of extensive knowledge and w strong analytical and critical abilities and logical thinking, w a wide range of complex, familiar and unfamiliar situations. ply highly effective lab skills and techniques. Critical use of	vith evidence of original Apply highly effective	I thought, and ability organizational and			

	В	learning outcomes. Show evand some unfamiliar situation	ridence of analytical and critical abiliti	lge and skills required for attaining at es and logical thinking, and ability to ap d presentational skills. Apply effective	oply knowledge to familiar		
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.					
	D	Show evidence of some colknowledge to solve problem	nerent and logical thinking, but with li	Is required for attaining some of the co mited analytical and critical abilities. Sh organizational and presentational skills or draw appropriate conclusions.	ow limited ability to apply		
	Fail	Demonstrate little or no evic of analytical and critical al problems. Organization and	dence of command of knowledge and pilities, logical and coherent thinking	skills required for attaining the course g. Show very little or no ability to ap fective or ineffective. Apply minimally o	oply knowledge to solve		
Course Type	Lecture wi	Lecture with laboratory component course					
Course Teaching	Activities		Details	No. of Hours			
& Learning Activities	Lectures				36		
	Laboratory				3		
	Tutorials				9		
	Reading /	Self study			72		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents		35	CLO 1,2,3,4		
	Examinat	ion	2-hour written exam	50	CLO 1,2,3		
	Laborator	y reports		15	CLO 1,4		
Required/recommended reading and online materials	Raymond			and Engineers (Thomson, 201	1, 8th edition)		
Course Website	http://moo	dle.hku.hk	·				

PHYS1050	Physics	s for engineering s	students (6 credits)	Academic Ye	ar 2020		
Offering Department	Physics			Quota			
Course Co-ordinator	Dr C C L	ing, Physics (ccling@l	hku.hk)				
Teachers Involved	(Dr C C L	Ling,Physics)					
Course Objectives	This cou	irse offers a compret	nensive training of physics for	engineers. It covers the major	or physical laws o		
_	mechanio	cs, electricity and mag	netism. A calculus-based appro-	ach is adopted.			
Course Contents			discuss the following topics:				
& Topics	Friction, System of Electrost Moving O	Units and Dimensional Analysis, Motion of a Particle in One and Two Dimensions, Newton's Laws of Motion, Friction, Circular Motion, Force, Impulse and Momentum, Force Polygon and Static Equilibrium, Work and Energy System of Particles, Moment of Inertia and Rotation of a Rigid Body, Simple Harmonic Motion and Pendulum; Electrostatic Fields and Potential, Gauss's Law, DC circuits, Magnetic field due to Moving Charges, Force on a Moving Charge in Magnetic Field, Biot-Savart law, Ampere's law, Electromagnetic Induction, Faraday's Law, Eddy Currents, AC circuits, Phases in Capacitive and Inductive Circuits, Power, DC and AC Generators, Transformer.					
Course Learning	On succe	essful completion of th	is course, students should be ab	ole to:			
Outcomes	CLO 1	describe and explain	the physical principles of mecha	anics, electricity and magnetism			
	CLO 2	apply these principles	s to situations of the physical an	d engineering world			
	CLO 3	analyze and solve ba	sic problems using the calculus	-based approach			
	CLO 4	acquire and interpret	experimental data to examine the	ne physical laws			
Pre-requisites and Co-requisites and Impermissible combinations)	(Level 2		ysics or Combined Science with or Module 2 of HKDSE Mathem gineering students.)				
Offer in 2020 - 2021	N Of	ffer in 2021 - 2022 : N		Examination			
Grade Descriptors	A		mastery at an advanced level of exter		attaining all the cours		
, ,	to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familia and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques						
	Correct use of data of results to draw appropriate conclusions. Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lact of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective lat skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.						
Course Type	Lecture v	with laboratory compor	nent course				
Course Teaching	Activitie	es	Details		No. of Hours		
Learning Activities	Lectures	3			36		
	Laborato	ory			6		
	Tutorials	3			8		
	Reading	/ Self study			72		
Assessment Methods and Weighting	Methods	s	Details	Weighting in final course grade (%)	Assessment Methods		

	Assignments		10	CLO 1,2,3	
	Examination	2-hour written exam	70	CLO 1,2,3	
	Laboratory reports		10	CLO 1,4	
	Test		10	CLO 1,2,3	
Required/recommended reading and online materials	Lecture notes provided by Course Coordinator R. Serway and J.W. Jewett: Physics for Scientists and Engineers (Thomson, 2009, 8th edition) R. D. Knight: Physics for Scientists and Engineers (Pearson, 2008, 2nd edition)				
Course Website	http://moodle.hku.hk				

PHYS1055	How this	ngs work (6 cre	dits)	Academic Yea	r 2020		
Offering Department	Physics	Quota					
Course Co-ordinator	Dr M K Yi	p, Physics (mankit)	@hku.hk)				
Teachers Involved	(Dr M K Y	'ip,Physics)					
Course Objectives	This course is designed for students in all disciplines and all years who are curious about science in daily life. Th course covers the working principles and mechanisms of the things and phenomena around us. Logical thinking and appreciation of science are emphasized with mathematics kept at a minimum. Students are trained to develo scientific intuition and to understand that many "magical" things in everyday life can be predictable.						
Course Contents & Topics	Topics inc are explor and the m	Topics include: the science in the household and the science of driving, sports and amusement. Daily applicat are explored with simple and lucid explanations. Developments in optical recording, medical imaging for diagn and the magnetic levitated trains in public transportation are introduced as examples of the modern technology. Contents of the course are constantly updated to reflect the advances in modern science and technology.					
Course Learning Outcomes	On succes CLO 1 de iss	On successful completion of this course, students should be able to: CLO 1 describe and discuss the physical principles that are behind the household appliances and the sc issues in daily life CLO 2 demonstrate their knowledge to related topics qualitatively					
	CLO 3 cri	iticize and express	views in logical and effective w	/ays			
	CLO 4 re	cognize the signific	cance of science and technolog	У			
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL						
Offer in 2020 - 2021	Y 2nd	d sem Offer in 202	21 - 2022 : Y	Examination	May		
Grade Descriptors (A+ to F)	В	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the cours learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and abilit to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the cours					
	С	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most					
	D	familiar situations. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	Demonstrate little or r of analytical and crit	no evidence of command of knowledge	e and skills required for attaining the course le inking. Show very little or no ability to appl			
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading /	/ Self study			80		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents		25	CLO 1,2,3,4		
	Examinat	tion	2-hour written exam	50	CLO 1,2,3,4		
	Presentat	tion		25	CLO 1,2,3,4		
B : 1/	Lecture no						
Required/recommended reading and online materials				ay Life (John Wiley & Sons, Inc, 2008	, 3rd edition)		

PHYS1056	Weather, climate and climate change (6 credits)	Academic Year	2020
Offering Department	Physics	Quota	
Course Co-ordinator	Dr K M Lee, Physics (kmlee@lily.physics.hku.hk)		
Teachers Involved	(Dr K M Lee,Physics) (Dr P W Li,Hong Kong Observatory) (Mr H W Tong,Hong Kong Observatory) (Mr W K Wong,Hong Kong Observatory)		
Course Objectives	Weather and climate play an important role in human activities and history. It students the fundamentals of weather, climate and climate changes, to arouse technological advancements.		
Course Contents & Topics	The course will encompass topics on: basic physical principles on weather p humidity, cold/warm fronts, thunderstorms and tropical cyclones; introducto climate. Through real life examples, students will get familiarized with interpretation of meteorological information, climatology and climate change. Experts from the Hong Kong Observatory (HKO) will participate in the course forecasts, public weather services, local severe weather phenomena, tropical cand climate change. Tentatively, there will be visit to the HKO to study the met	ry weather analys the weather/clima to cover aspects cyclones, climatolo	sis, forecast and te science and on daily weather gy of Hong Kong,

	the operational activities on weather and climate.						
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 recall the basic principles of weather and climate						
		ipply the principles to inte or media	erpret weather / climate inforr	mation, for example from the HK	O web site, interne		
		dentify and explain the divorld	fferences of weather and clim	nate in Hong Kong as compared	to other parts of the		
	CLO 4 e	explain the basic causes	of climate change and its pote	ential impacts			
	CLO 5 d	lescribe and discuss the	daily operational activities in t	the HKO			
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL	,					
Offer in 2020 - 2021	Y 1s	t sem Offer in 2021 - 2	022 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	A	learning outcomes. Show s to apply knowledge to a w presentational skills.	trong analytical and critical abilities a ride range of complex, familiar and	nsive knowledge and skills required for and logical thinking, with evidence of ori unfamiliar situations. Apply highly effe	ginal thought, and ability ctive organizational and		
	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	Demonstrate little or no evid of analytical and critical a	dence of command of knowledge an	d skills required for attaining the course ng. Show very little or no ability to ap			
Course Type	Lecture-b	pased course	· ·				
Course Teaching	Activitie	es .	Details		No. of Hours		
& Learning Activities	Lectures	•			36		
_	Tutorials	S			8		
	Reading	/ Self study			80		
Assessment Methods and Weighting	Method	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm	ents		25	CLO 1,2,3,4,5		
	Examina	ation	2-hour written exam	50	CLO 1,3,4,5		
	Test			25	CLO 1,3,4,5		
Required/recommended	Lecture r	notes provided by Course	Coordinator				
reading and online materials	Frederick	Lutgens and Edward Ta	arbuck: The Atmosphere (Pea	arson Prentice Hall, 2013)			
Course Website	http://mo	odle.hku.hk					

PHYS1057	Kitchen	science (6 credits) Academic Ye	ar 2020				
Offering Department	Physics	Quota					
Course Co-ordinator	Prof A B [Djurisic, Physics (dalek@hku.hk)					
Teachers Involved	(Prof A B	Djurisic, Physics)					
Course Objectives	The course aims to improve students' understanding of basic science behind the common daily activities related food and cooking and to develop their critical thinking skills.						
Course Contents & Topics	food prep demonstra The topics foams an jelly); crys and chen application values in textures);	se will introduce basic scientific concepts and principles necessary to understand operation, as well as kitchen tools. The introduced concepts will be illustrated in relations. Is include: basic food molecules (water, carbohydrates, fats, protein); debubles (various examples, beer, sodas, ice-cream); colloids, emulsions, gelatic stallization (sugar, sugar syrups, honey, chocolate); taste and flavor (herbs, spices) inical reactions (Maillard reactions, caramelization, etc.); chemical reactions for not cakes, bread and cookies; fermentation (alcoholic beverages, fermented dairy cooking, natural and artificial food colorings, culinary curiosities; molecular gastronom principles of operation of kitchen tools, such as non-stick cookware, pressure cookenicrowave ovens, etc.	on (various sauces cooking processes rising dough with products, tofu); pl- ny (novel flavors and				
Course Learning Outcomes	CLO 1 de CLO 2 ex CLO 3 ille CLO 4 ar	ssful completion of this course, students should be able to: escribe principles of operation of kitchen tools encountered in daily life kplain basic physical and chemical processes involved in food preparation ustrate how preparation method affects the flavor and texture of food halyze common methods of food preparation and understand scientific reaso rocedures in certain ways	ns for performing				
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL						
Offer in 2020 - 2021	N Off	er in 2021 - 2022 : N Examination					
Grade Descriptors (A+ to F)	Α	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of or to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effe presentational skills.	ginal thought, and ability				
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to ap and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to a familiar situations. Apply moderately effective organizational and presentational skills.					

	Show evidence of knowledge to so Fail Demonstrate little of analytical and	rtial but limited command of knowledge and skills requ of some coherent and logical thinking, but with limited al live problems. Apply limited or barely effective organizat e or no evidence of command of knowledge and skills i d critical abilities, logical and coherent thinking. Shor ization and presentational skills are minimally effective	nalytical and critical abilities. Sh ional and presentational skills. required for attaining the course w very little or no ability to ap	learning outcomes. Lack	
Course Type	Lecture-based course				
Course Teaching	Activities	Details		No. of Hours	
& Learning Activities	Lectures			36	
	Tutorials	inlcuding demonstration (12 hours		24	
	Reading / Self study			72	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignments	essay & student presentations	70	CLO 1,2,3,4	
	Examination		30	CLO 1,2,3,4	
Required/recommended reading and online materials	Examination Lecture notes provided by Course Coordinator T. Lister and H. Blumenthal: Kitchen Chemistry (Royal Society of Chemistry, 2005) S. T. Beckett: The Science of Chocolate (Royal Society of Chemistry, 2005) R. L. Wolke: What Einstein Told His Cook (W.W. Norton & Company Inc., New York, 2002 Peter Barham: The Science of Cooking (Springer-Verlag, Berlin, 2001) A. Gardiner and S. Wilson: The In Cook (Exploratorium, Henry Holt and Company, LLC, New York, 1998) H. McGee: On food and cooking: The Science and Lore of the Kitchen (HarperCollins Publishers, London,				

PHYS1150	Probler	m solving in phy	sics (6 credits)	Academic \	/ear 2020	
Offering Department	Physics		,	Quota		
Course Co-ordinator	Dr M K Y	ip, Physics (mankit	@hku.hk)	'		
Teachers Involved		Yip,Physics)	,			
Course Objectives	sets that focus on analytica series, n Mathema	This is the first course in our course series that introduces problem solving, mathematical and computational sk sets that are commonly used in the study of university-level physics. Instead of adopting a cookbook approach, v focus on training students how to think and work as physicists through tackling simple physics problems by bo analytical and numerical means. After completion, interested students may take the second level courses in th series, namely, PHYS2150 and/or PHYS2155 and/or PHYS2160. (Knowledge of Module 1 or Module 2 in HKDS Mathematics, or MATH1011, or equivalent is advantageous, though not required.)				
Course Contents & Topics	This course trains students to think and act as physicists by introducing basic problem solving, mathematical a computational skills that are commonly used in the study of university-level physics. Topics include: the use vectors and their operations, differentiation, integration, differential equations, several variables differentiation matrix operation, complex numbers, and rudiment of numerical methods in tackling simple physic problems. Basic MATLAB commands will be introduced and used in this course.					
Course Learning	On succe	essful completion of	this course, students should be able to	D:		
	CLO 2 a CLO 3 r S CLO 4 c CLO 5 f	CLO 1 state physical systems by the language of mathematics and employ mathematical logic and reasoning read physics CLO 2 apply calculus to solve problems CLO 3 review the features of various solving tools in physics as well as plan and select appropriate tools wh solving physical problems CLO 4 describe the connections between mathematical equations and physical problems CLO 5 formulate and operate physical problems both qualitatively and quantitatively CLO 6 interpret and judge the physical meaning of result after calculations				
Pre-requisites and Co-requisites and Impermissible combinations)			Physics or equivalent, or Pass in PHYS			
Offer in 2020 - 2021	Y 1s	st sem 2nd sem (Offer in 2021 - 2022 : Y	Examinatio	n Dec May	
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the counterprise learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and abilities apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational at presentational skills.					
(AT IOF)	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the coulearning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to fam and some unfamiliar situations. Apply effective organizational and presentational skills.				
	C	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learnin outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to mo familiar situations. Apply moderately effective organizational and presentational skills.				
		familiar situations. Ap			apply knowledge to mo	
	D	familiar situations. Ap Demonstrate partial to Show evidence of soil knowledge to solve pi	out limited command of knowledge and skills re me coherent and logical thinking, but with limiter roblems. Apply limited or barely effective organization	quired for attaining some of the d analytical and critical abilities. S zational and presentational skills.	course learning outcome Show limited ability to ap	
.	Fail	familiar situations. Ap Demonstrate partial It Show evidence of soi knowledge to solve pi Demonstrate little or of analytical and crit problems. Organization	out limited command of knowledge and skills re me coherent and logical thinking, but with limited	equired for attaining some of the danalytical and critical abilities. Stational and presentational skills. Is required for attaining the cours how very little or no ability to	o apply knowledge to mo course learning outcome Show limited ability to app se learning outcomes. La	
	Fail Lecture-l	familiar situations. Ap Demonstrate partial it Show evidence of sol knowledge to solve pi Demonstrate little or i of analytical and crit problems. Organizatio based course	out limited command of knowledge and skills re me coherent and logical thinking, but with limiter roblems. Apply limited or barely effective organia no evidence of command of knowledge and skil ical abilities, logical and coherent thinking. Son and presentational skills are minimally effection	equired for attaining some of the danalytical and critical abilities. Stational and presentational skills. Is required for attaining the cours how very little or no ability to	o apply knowledge to mo course learning outcome Show limited ability to ap se learning outcomes. Le apply knowledge to sol	
ourse Teaching	Fail Lecture-l	familiar situations. Ap Demonstrate partial it Show evidence of sol knowledge to solve pi Demonstrate little or i of analytical and crit problems. Organizatio based course	out limited command of knowledge and skills re me coherent and logical thinking, but with limite- roblems. Apply limited or barely effective organis no evidence of command of knowledge and skil ical abilities, logical and coherent thinking. S	equired for attaining some of the danalytical and critical abilities. Stational and presentational skills. Is required for attaining the cours how very little or no ability to	o apply knowledge to mo course learning outcome Show limited ability to app se learning outcomes. La apply knowledge to soli	
Course Teaching	Fail Lecture-l Activitie Lectures	familiar situations. Ap Demonstrate partial the Show evidence of sol knowledge to solve pi Demonstrate little or i of analytical and crit problems. Organization based course	out limited command of knowledge and skills re me coherent and logical thinking, but with limiter roblems. Apply limited or barely effective organia no evidence of command of knowledge and skil ical abilities, logical and coherent thinking. Son and presentational skills are minimally effection	equired for attaining some of the danalytical and critical abilities. Stational and presentational skills. Is required for attaining the cours how very little or no ability to	o apply knowledge to me course learning outcome show limited ability to ap se learning outcomes. La apply knowledge to sol	
Course Teaching	Fail Lecture-l Activitie Lectures Tutorials	familiar situations. Ap Demonstrate partial the Show evidence of sol knowledge to solve pi Demonstrate little or of analytical and crit problems. Organization based course es	out limited command of knowledge and skills re me coherent and logical thinking, but with limiter roblems. Apply limited or barely effective organia no evidence of command of knowledge and skil ical abilities, logical and coherent thinking. Son and presentational skills are minimally effection	equired for attaining some of the danalytical and critical abilities. Stational and presentational skills. Is required for attaining the cours how very little or no ability to	o apply knowledge to me course learning outcome Show limited ability to ap se learning outcomes. La apply knowledge to sol	
ourse Teaching Learning Activities	Fail Lecture-l Activitie Lectures Tutorials Reading	familiar situations. Ap Demonstrate partial the Show evidence of sol knowledge to solve pi Demonstrate little or i of analytical and crit problems. Organization based course es S S J / Self study	out limited command of knowledge and skills re me coherent and logical thinking, but with limiter roblems. Apply limited or barely effective organiano evidence of command of knowledge and skilical abilities, logical and coherent thinking. Son and presentational skills are minimally effective the control of the control o	equired for attaining some of the d analytical and critical abilities. Stational and presentational skills. Is required for attaining the cours how very little or no ability to ve or ineffective.	o apply knowledge to me course learning outcome show limited ability to ap se learning outcomes. Le apply knowledge to sol	
Course Teaching Learning Activities Assessment Methods	Fail Lecture-l Activitie Lectures Tutorials	familiar situations. Ap Demonstrate partial the Show evidence of sol knowledge to solve pi Demonstrate little or i of analytical and crit problems. Organization based course es S S J / Self study	out limited command of knowledge and skills re me coherent and logical thinking, but with limiter roblems. Apply limited or barely effective organia no evidence of command of knowledge and skil ical abilities, logical and coherent thinking. Son and presentational skills are minimally effection	equired for attaining some of the danalytical and critical abilities. Stational and presentational skills. Is required for attaining the cours how very little or no ability to	o apply knowledge to me course learning outcome Show limited ability to ap se learning outcomes. La apply knowledge to sol	
Course Teaching Learning Activities Assessment Methods	Fail Lecture-l Activitie Lectures Tutorials Reading	familiar situations. Ap Demonstrate partial the Show evidence of sol knowledge to solve pi Demonstrate little or i of analytical and crit problems. Organizatio based course es S S J / Self study S	out limited command of knowledge and skills re me coherent and logical thinking, but with limiter roblems. Apply limited or barely effective organiano evidence of command of knowledge and skilical abilities, logical and coherent thinking. Son and presentational skills are minimally effective the control of the control o	rquired for attaining some of the d analytical and critical abilities. Stational and presentational skills. Is required for attaining the cours how very little or no ability to ve or ineffective. Weighting in final	course learning outcomeshow limited ability to ap se learning outcomes. La apply knowledge to sol No. of Hours 36 12 80 Assessment Methods	
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	Fail Lecture-I Activitie Lectures Tutorials Reading Method:	familiar situations. Ap Demonstrate partial it Show evidence of sol knowledge to solve pi Demonstrate little or i of analytical and cri problems. Organizatio based course 95 S S J / Self study S nents	Details Including computational Including computational	quired for attaining some of the d analytical and critical abilities. Stational and presentational skills. Is required for attaining the cours how very little or no ability to we or ineffective. Weighting in final course grade (%)	o apply knowledge to me course learning outcome show limited ability to apply knowledge to sol se learning outcomes. La apply knowledge to sol No. of Hours 36 12 80 Assessment Methods to CLO Mapping	

online materials	Steven C. Chapra: Applied Numerical Methods with MATLAB for Engineers and Scientists (McGraw-Hill Education, 2017, 4th edition) Joel R. Hass, Maurice D. Weir, and George B. Thomas, Jr: University Calculus: Early Transcendentals (Pearson, 2015. 3rd edition)
Course Website	http://moodle.hku.hk

our daily life phenomena and activities. It is targeted to those with little physics background and is conducted no descriptions in differential and integral calculus. After completing this course, interested students may move to take PHYS1150 or PHYS1250. The course has a general coverage in most physics topics and is conducted with no descriptions in differential integral calculus. Emphasis will be stressed on the understanding of various physical phenomena in daily through qualitative and simple quantitative analysis. The course contents cover. Mechanics, Heat, Optics, We Electricity and Magnetism. Outcomes CLO 1 describe and distinguish the concepts and principles in introductory study of physics CLO 2 (CLO 2 incognize the underlying physical principles behind various daily life phenomena (CLO 3 is explain physical phenomena using proper physical laws and theories CLO 4 inply simple mathematical techniques for quantitative analysis in solving physics problems Pre-requisites (and Co-requisites and impermissible combinations) Not for students with level 3 or above in HKDSE Physics; and Not for students who have passed in PHYS1050 or PHYS1150 or PHYS1250, or already enrolled in these could combinations of the students who have passed in any level 2 PHYS course or above. Offer in 2020 - 2021 Grade Descriptors (A+ to F) A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the councies and some unfamiliar situations. Apply highly effective organizational and presentational skills. Demonstrate substantial command of a broad-drage of knowledge and skills required for attaining all the councies and some unfamiliar situations. Apply influence organizational and presentational skills. Demonstrate partial but inimited command of knowledge and skills required for attaining all the councies and some unfamiliar situations. Apply effective organizational and presentational skills. Demonstrate partial but inimited command of knowledge and skills required	PHYS1240	Physics	by inquiry (6 credit	ts)	Academic Yea	r 2020	
Course Objectives	Offering Department	Physics			Quota		
This course aims at providing students a solid background and knowledge in physics as well as its connection or daily life phenomena and activities. It is targeted to those with little physics background and is conducted no descriptions in differential and integral calculus. After completing this course, interested students may move to take PHYS1150 or PHYS1250. The course has a general coverage in most physics topics and is conducted with no descriptions in differential integral calculus. Emphasis will be stressed on the understanding of various physical phenomena in daily through qualitative and simple quantitative analysis. The course contents cover: Mechanics, Heat, Optics, W. Electricity and Magnetism. Course Learning Outcomes CLO 1 describe and distinguish the concepts and principles in introductory study of physics CLO 2 recognize the underlying physical principles behind various daily life phenomena CLO 3 explain physical phenomena using proper physical laws and theories CLO 4 apply simple mathematical techniques for quantitative analysis in solving physics problems NIL Not for students with level 3 or above in HKDSE Physics; and Not for students who have passed in PHYS1050 or PHYS1150 or PHYS1250, or already enrolled in these could and Not for students who have passed in any level 2 PHYS course or above. Offer in 2020 - 2021 Grade Descriptors (A+ to F) A Demonstrate brough makely at an advanced level of extensive knowledge and skills required for attaining all the or learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of riginal thought, and it loaply knowledge to insting a studential studential and critical abilities. And projection of particular and critical abilities and logical thinking, with evidence of riginal thought, and it loaply knowledge in the course learning outcomes. Show witnere of some analytical and critical abilities and logical thinking, with evidence of riginal thought, and it loaply knowledge in the course learning outcomes.	Course Co-ordinator	Dr M Su, F	Physics (mengsu84@hk	ku.hk)			
our daily life phenomena and activities. It is targeted to those with little physics background and its conducted no descriptions in differential and integral calculus. After completing this course, interested students may move to take PHYS1150 or PHYS1250. The course has a general coverage in most physics topics and is conducted with no descriptions in differential integral calculus. Emphasis will be stressed on the understanding of various physical phenomena in daily through qualitative and simple quantitative analysis. The course contents cover: Mechanics, Heat, Optics, We Electricity and Magnetism. On successful completion of this course, students should be able to: Clo 2 crecognize the underlying physical principles behind various daily life phenomena CLO 3 explain physical phenomena using proper physical laws and theories CLO 4 apply simple mathematical techniques for quantitative analysis in solving physics problems NIL Not for students with level 3 or above in HKDSE Physics; and Not for students with have passed in any level 2 PHYS fourse or above. Offer in 2020 - 2021 Grade Descriptors (A* to F) A Demonstrate brough mastery at an advanced level of extensive knowledge and skills required for attaining all the or learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Pail Demonstrate substantial command of a broad range of knowledge and skills required for attaining at lates and some unfamiliar studions. Apply highly effective organizational and presentational skills. Early knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no echience of some analytical and critical abilities and logical thinking, and ability to apply knowledge to infamiliar should command of a broad range of knowledge and skills required for attaining at least most of the cou	Teachers Involved	(Dr M Su,	Physics)				
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CLO 3 explain physical phenomena using proper physical laws and theories	Outcomes	CLO 1 d	escribe and distinguish	the concepts and principles in intro	ductory study of physics		
Pre-requisites (and Co-requisites (and Co-requisites (and Inpermissible combinations) Not for students with level 3 or above in HKDSE Physics; and Not for students with level 3 or above in HKDSE Physics; and Not for students who have passed in PHYS1050 or PHYS1250, or already enrolled in these coulombinations) Offer in 2020 - 2021 Offer in 2020 - 2021 Offer in 2020 - 2021 Offer in 2020 - 2021 Offer in 2020 - 2021 A Demonstrate brough mastery at an advanced level of extensive knowledge and skills required for attaining all the collearing outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and to apply knowledge to familiar and unfamiliar situations. Apply independent of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and unfamiliar situations. Apply independent of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar situations. Apply independent of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar situations. Apply independent of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some coherent and clogical thinking, but with skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar situations. Apply moderately effective organizational and presentational skills. D D Demonstrate partial but limited command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some ondertally effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining and critical abilities. Show limited ability to knowl		CLO 2 r	ecognize the underlying	physical principles behind various	daily life phenomena		
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Not for students with level 3 or above in HKDSE Physics; and Not for students who have passed in PHYS1050 or PHYS1250, or already enrolled in these coucombinations) Offer in 2020 - 2021 Y 2nd sem Offer in 2021 - 2022 : Y		CLO 4 a	pply simple mathematic	cal techniques for quantitative analys	sis in solving physics proble	ems	
Offer in 2020 - 2021 Y 2nd sem Offer in 2021 - 2022 : Y Grade Descriptors (A+ to F) A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the or to apply knowledge to familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the celearing outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar situations. Apply moderately effective organizational and presentational skills. D Demonstrate partial but limited command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to similar situations. Apply moderately effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some overlength and logical thinking required for attaining some of the course learning outcomes. Organizational and critical abilities and logical thinking required for attaining most of the course learning outcomes. Show evidence of some overlength of command of knowledge and skills required for attaining most of the course learning outcomes. Organizational and presentational skills. Fail Demonstrate itilities of command of knowledge and skills required for attaining most of the course learning outcomes. Organizational and presentational skills are minimally effecti	(and Co-requisites and Impermissible	Not for stu Not for stu and	dents who have passed	d in PHYS1050 or PHYS1150 or PH	•	d in these courses	
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outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar situations. Apply moderately effective organizational and presentational skills. D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcord Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to sproblems. Organization and presentational skills are minimally effective or ineffective. Course Type Lecture-based course Activities Details No. of Hour Activities Lectures Tutorials Reading / Self study Assessment Methods and Weighting Methods Details Weighting in final course grade (%) Methods Methods Assessment Methods including in-class quizzes (10%) Examination 2-hour written exam 50 CLO 1,2,3, Test Lecture notes provided by Course Coordinator John D. Cutnell and Kenneth W. Johnson: Introduction to Physics (John Wiley & Sons, Inc., 2013) Paul G. Hewitt: Conceptual Physics (Addison Wesley, 2009, 11th edition)			B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar				
Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes, of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to a problems. Organization and presentational skills are minimally effective or ineffective. Course Type Lecture-based course Activities Details No. of Hour Basessment Methods and Weighting Reading / Self study Methods Reading / Self study Details Weighting in final course grade (%) Methods Assessment Methods and Weighting Assignments including in-class quizzes (10%) Examination 2-hour written exam 50 CLO 1,2,3, Test Lecture notes provided by Course Coordinator John D. Cutnell and Kenneth W. Johnson: Introduction to Physics (John Wiley & Sons, Inc., 2013) Paul G. Hewitt: Conceptual Physics (Addison Wesley, 2009, 11th edition)		С	outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most				
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Reading / Self study Assessment Methods and Weighting Methods Assignments Examination Test Required/recommended reading and conline materials Reading / Self study Methods Details Details Weighting in final course grade (%) Methods to CLO Mapp (Methods & Learning Activities	Lectures				36		
Assessment Methods and Weighting Methods Details Weighting in final course grade (%) Assessment Methods to CLO Mapp (Methods (Methods to CLO Mapp (Methods (Methods to CLO Mapp (Methods		Tutorials				12	
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Examination 2-hour written exam 50 CLO 1,2,3, Test 25 CLO 1,2,3, Required/recommended reading and online materials Examination 2-hour written exam 50 CLO 1,2,3, CLO 1,2,3,		Methods		Details		Assessment Methods to CLO Mapping	
Test 25 CLO 1,2,3, Required/recommended reading and online materials 25 CLO 1,2,3, Paul G. Hewitt: Conceptual Physics (Addison Wesley, 2009, 11th edition)		Assignme	nts	including in-class quizzes (10%)	25	CLO 1,2,3,4	
Required/recommended Lecture notes provided by Course Coordinator John D. Cutnell and Kenneth W. Johnson: Introduction to Physics (John Wiley & Sons, Inc., 2013) Paul G. Hewitt: Conceptual Physics (Addison Wesley, 2009, 11th edition)		Examinat	on	2-hour written exam		CLO 1,2,3,4	
reading and John D. Cutnell and Kenneth W. Johnson: Introduction to Physics (John Wiley & Sons, Inc., 2013) Paul G. Hewitt: Conceptual Physics (Addison Wesley, 2009, 11th edition)		Test			25	CLO 1,2,3,4	
Γαγιποτία Α. Serway and Crins vullie: College Physics (Brooks Cole, 2011, 9th edition)	reading and	John D. C Paul G. He	utnell and Kenneth W. J ewitt: Conceptual Physic	Johnson: Introduction to Physics (Jocs (Addison Wesley, 2009, 11th edit	ion)	3)	
Course Website http://moodle.hku.hk	Course Websits		•	une. Conege Physics (Brooks Cole,	2011, 901 EadOH)		

PHYS1250	Fundamental physics (6 credits) Acad	demic Year	2020				
Offering Department	Physics Quot	ota					
Course Co-ordinator	Dr F C C Ling, Physics (ccling@hku.hk)						
Teachers Involved	(Dr F C C Ling,Physics) (Dr J C S Pun,Physics)						
Course Objectives	This is the first physics course for those who want to minor in physics or astronomy a to have an overview in physics. It covers the fundamental blocks in physics in one so physics are emphasized and the mathematical treatment is moderate. Those who also take this course as one of their astronomy, math/physics or physics major require	semester. Co enter HKU b	nceptual ideas in				
Course Contents & Topics	Topics include: Mechanics, Wave Motions, Geometric and Physical Optics, Thermod and Modern Physics.	odynamics, E	lectromagnetism,				
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 describe and explain the fundamental physical principles						
	CLO 2 apply these principles, together with logical and mathematical reasoning, to situations of the physical world						
	CLO 3 analyse and solve problems with the aids of mathematics						
	CLO 4 acquire and interpret experimental data to examine the physical laws						
Pre-requisites	Level 3 or above in HKDSE Physics or equivalent, or Pass in PHYS1240; and						
(and Co-requisites	Not for students who have passed in PHYS1050, or already enrolled in this course; an	nd					
and Impermissible combinations)	Not for students who have passed in any level 2 PHYS course or above.						

Offer in 2020 - 2021	Y 1st	t sem 2nd sem Offer	111 2021 - 2022 . 1	Examination	Dec May	
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.				
	В	learning outcomes. Show and some unfamiliar situat	evidence of analytical and critical abilit	dge and skills required for attaining at ties and logical thinking, and ability to ap nd presentational skills. Apply effective	oply knowledge to familia	
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
	D	Show evidence of some control knowledge to solve problem	pherent and logical thinking, but with li	Ils required for attaining some of the committed analytical and critical abilities. Shorganizational and presentational skills of draw appropriate conclusions.	ow limited ability to app	
	Fail	of analytical and critical	abilities, logical and coherent thinkin	d skills required for attaining the course	oply knowledge to solv	
			d presentational skills are minimally e se of data and results and/or unable to		effective or ineffective la	
Course Type	Lecture w		se of data and results and/or unable to		effective or ineffective la	
Course Teaching	Lecture w	skills and techniques. Misu with laboratory compone	se of data and results and/or unable to		No. of Hours	
Course Teaching		skills and techniques. Misu vith laboratory compone s	se of data and results and/or unable to nt course			
Course Teaching	Activities	skills and techniques. Misuvith laboratory compones	se of data and results and/or unable to nt course		No. of Hours	
Course Teaching	Activities Lectures	skills and techniques. Misu vith laboratory compone s	se of data and results and/or unable to nt course		No. of Hours	
Course Teaching	Activities Lectures Laborato Tutorials	skills and techniques. Misu vith laboratory compone s	se of data and results and/or unable to nt course		No. of Hours 36 6	
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborato Tutorials	skills and techniques. Misu vith laboratory compone s ory / Self study	se of data and results and/or unable to nt course		No. of Hours 36 6 8	
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborato Tutorials Reading	skills and techniques. Misu vith laboratory compone s s yry / Self study	ise of data and results and/or unable to nt course Details	o draw appropriate conclusions. Weighting in final	No. of Hours 36 6 8 80 Assessment Methods	
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborator Tutorials Reading Methods	skills and techniques. Misuvith laboratory compone s pry / Self study ents	ise of data and results and/or unable to nt course Details	Weighting in final course grade (%)	No. of Hours 36 6 8 80 Assessment Methods to CLO Mapping	
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborato Tutorials Reading Methods Assignme Examinat	skills and techniques. Misuvith laboratory compone s pry / Self study ents	ise of data and results and/or unable to nt course Details Details	Weighting in final course grade (%)	No. of Hours 36 6 8 80 Assessment Methods to CLO Mapping CLO 1,2,3,4	
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	Activities Lectures Laborato Tutorials Reading Methods Assignme Examinat	skills and techniques. Misuvith laboratory compone s pry / Self study ents tion	ise of data and results and/or unable to nt course Details Details	Weighting in final course grade (%) 10 50	No. of Hours 36 6 8 80 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3	
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborator Tutorials Reading Methods Assignme Examinat Laborator Test Lecture nereal Raymond James S.	skills and techniques. Misuvith laboratory compone s ory / Self study ents tion ory reports otes provided by Cours d A. Serway and John W	se of data and results and/or unable tont course Details Details 2-hour written exam e Coordinator	Weighting in final course grade (%) 10 50 15	No. of Hours 36 6 8 80 Assessment Methods to CLO Mappin, CLO 1,2,3,4 CLO 1,2,3 CLO 1,4 CLO 1,2,3	

PHYS1650	Nature of the universe (6 credits)		Academic Year	2020		
Offering Department	Physics		Quota			
Course Co-ordinator	Dr K M Lee, Physics (kmlee@lily.physics.hku.	hk)				
Teachers Involved	(Dr K M Lee,Physics)					
Course Objectives	This is an introductory course in astronomy for students in all disciplines and all years. This is also the first cour in our series of two compulsory courses to introduce basic astronomy knowledge, methods and recent advance for astronomy minor. No prior knowledge in astronomy, physics, and higher mathematics is required, but whelp. After completing this course, interested students may take the second course in this series, named PHYS2650.					
Course Contents & Topics	Topics covered include the observational aspect of astronomy (including constellations and planets), the physics of our solar system, and our own Sun, stars and their evolution, galaxies, blackholes, and cosmology. It also provides students with a basic understanding of the relationship of astronomy to life and how our nature works of the macroscopic level. Students are expected to participate actively in the night sky observations.					
Course Learning	On successful completion of this course, stude	ents should be able to:				
Outcomes	CLO 1 identify and describe the major objet galaxies), and explain their main properties.	erties	<u> </u>	uding stars and		
	CLO 2 use the celestial sphere model to desc					
	CLO 3 review the evolution of the world-view discovery of the expansion of the university of the expansion of the university of the expansion of the university of the expansion of the university of the expansion of the world-view of the expansion of the world-view of the world-view of the expansion of the world-view	· ·	the heliocentric	model and the		
	 CLO 4 apply quantitative physical laws, including Kepler's three laws of planetary motion, Newton's law of universal gravitation, Doppler shift formula and Hubble's law to calculate and solve simple astronomical problems CLO 5 explain the evolution of stars and the evolution of the universe 					
	CLO 6 communicate astronomical problems English		tronomical termi	nology and good		
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL					
Offer in 2020 - 2021	Y 1st sem 2nd sem Offer in 2021 - 20	22 : Y	Examination	Dec May		
Grade Descriptors (A+ to F)	learning outcomes. Show strong analytical to apply knowledge to a wide range of co	anced level of extensive knowledge and s and critical abilities and logical thinking, wit omplex, familiar and unfamiliar situations. A observation skills and techniques. Critical us	th evidence of original Apply highly effective	aining all the course al thought, and abilit e organizational and		
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective observation skills and techniques. Correct use of data of results to draw appropriate conclusions.					
	outcomes. Show evidence of some analyt familiar situations. Apply moderately effec skills and techniques. Mostly correct but so	mand of knowledge and skills required for ical and critical abilities and logical thinking tive organizational and presentational skills me erroneous use of data and results to draw	g, and ability to appl s. Apply moderately w appropriate conclu	y knowledge to mos effective observation sions.		
	Show evidence of some coherent and logic knowledge to solve problems. Apply limite	of knowledge and skills required for attaining al thinking, but with limited analytical and cri d or barely effective organizational and pre bility to use data and results to draw approp	itical abilities. Show sentational skills. Ap	limited ability to apply		

	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to s problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective. Skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.						
Course Type	Lecture with laboratory co	cture with laboratory component course					
Course Teaching	Activities	Details		No. of Hours			
& Learning Activities	Lectures			36			
	Laboratory			12			
	Tutorials			8			
	Reading / Self study			64			
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments		25	CLO 1,2,3,4,5,6			
	Examination	2-hour written exam	50	CLO 1,2,3,4,5,6			
	Test		25	CLO 1,2,3,4,5,6			
Required/recommended reading and online materials	E. Chaisson and S. McMil	llan: Astronomy Today (Pearson, 2011)					
Course Website	http://moodle.hku.hk						

PHYS2055	Introdu	ctory relativity (6 cre	edits)	Academic Yea	r 2020	
Offering Department	Physics	, , , ,	•	Quota		
Course Co-ordinator		ee, Physics (kmlee@lily.	physics.hku.hk)			
Teachers Involved		_ee,Physics)	,			
Course Objectives	in all disc	ciplines and all years wit	h science background. İt is a	al relativity. It is designed as an e Iso a discipline elective for the p pre-requisites for PHYS4653 and	hysics major/mino	
Course Contents & Topics	Examples	s of time dilation and sp	pace contraction, Paradoxes	e versus Einstein's conceptions of relativity including the famous e discussion on general relativity.	twin paradox and	
Course Learning	On succe	essful completion of this	course, students should be ab	le to:		
Outcomes	CLO 1	recall the setup and sig	gnificance of Michelson-Morle	y experiment		
	CLO 2	state the basic postula	tes and the spacetime concep	ot of special relativity		
	CLO 3	explain time dilation ar	nd length contraction			
	CLO 4	describe Lorentz trans	formation and its applications			
	CLO 5	state the resolution of	the twin and pole-in-the-barn i	paradoxes		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in F	PHYS1050 or PHYS1150	or PHYS1250 or ENGG1300			
Offer in 2020 - 2021	Y 1st	Y 1st sem Offer in 2021 - 2022 : Y Examination				
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
		Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture-b	pased course				
Course Teaching	Activitie	es	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials	}			8	
	Reading	/ Self study			80	
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignm	ents		25	CLO 2,4	
	Examina		2-hour written exam	50	CLO 1,2,3,4,5	
	Test 25 CLO 1,2,3,4,5					
		sture notes provided by Course Coordinator pert Resnick and David Halliday: Basic Concepts in Relativity and Early Quantum Theory (MacMillan Pub. 12, 2nd revised edition) win F. Taylor and John A. Wheeler: Spacetime Physics: Introduction to Special Relativity (W. H. Freeman, 1992				
Required/recommended reading and online materials	Lecture n Robert R 1992, 2nd	Resnick and David Hallid d revised edition) Taylor and John A. Whe	day: Basic Concepts in Relat		•	

PHYS2150	Methods in physics I (6 credits)	Academic Year	2020			
Offering Department	Physics	Quota				
Course Co-ordinator	Dr F K Chow, Physics (judychow@hku.hk)					
Teachers Involved	(Dr F K Chow, Physics)					
Course Objectives	This is one of the second level courses in our series of courses that introduces problem solving, mathematical and					

	computational skill sets that are commonly used in the study of university-level physics. Instead of the cookbook approach, we focus on training students how to think and work as physicists through tackling simple physics problems by both analytical and numerical means. After completion, interested students may take the other second level courses in this series PHYS2155 and/or PHYS2160 or the third level course in this series PHYS3150.					
Course Contents & Topics	studying dimensio and vector Further M	This course introduces the principles and theories of various mathematical methods and skills that are essential for studying university physics. Topics include: ordinary differential equations, partial differential equations, three-dimensional coordinate geometry, partial differentiation, multiple integration, vector functions and motion in space, and vector analysis. Applications to physical systems and various practical problems solving skills are discussed. Further MATLAB commands and basic MATLAB programming will be introduced and used in this course.				
Course Learning Outcomes	CLO 1 rd CLO 2 d CLO 3 s CLO 4 d CLO 5 s	On successful completion of this course, students should be able to: CLO 1 review the theory and principles of mathematical methods and compare the features of various methods CLO 2 describe the connections between mathematical equations and physical problems State and set up mathematical equations to describe the dynamics and evolution of physics systems CLO 3 demonstrate knowledge of choosing correct solution of mathematical equations CLO 5 solve various problems and operate the calculations with computer CLO 6 interpret and judge the physical meaning of result after calculations				
Pre-requisites (and Co-requisites and Impermissible combinations)		ass in MATH1013 or MATH1821 or MATH1851 or PHYS1150				
Offer in 2020 - 2021	Y 1st	t sem Offer in 2021	- 2022 : Y	Examinatio	n Dec	
Grade Descriptors (A+ to F)	A	learning outcomes. Sh to apply knowledge to	mastery at an advanced level of extensive ow strong analytical and critical abilities and l familiar and unfamiliar situations. Apply highly	ogical thinking, with evidence of effective organizational and pres	original thought, and ability entational skills.	
	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D Fail	Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack				
			cal abilities, logical and coherent thinking. So an and presentational skills are minimally effecti		apply knowledge to solve	
Course Type	Lecture-b	ased course	'			
Course Teaching	Activitie	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			80	
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignm	ents	Including computational assignments	20	CLO 1,2,3,4,5,6	
	Examina	tion	2-hour written exam	50	CLO 2,3,4	
	Test			30	CLO 1,2,3,4	
Required/recommended reading and online materials	Susan J. Allen B. I Joel Has 2016, 3rd K. F. Rile Guide (C	ecture notes provided by Course Coordinator usan J. Colley: Vector Calculus (Pearson, 2011, 4th edition) llen B. Downey: Physical Modeling in MATLAB (Green Tea Press, 2008) oel Hass, Maurice D. Weir, and George B. Thomas Jr.: University Calculus: Early Transcendentals (Pearson, 016, 3rd edition) . F. Riley, M. P. Hobson, and S. J. Bence: Mathematical Methods for Physics and Engineering: A Comprehensive iuide (Cambridge University Press, 2006, 3rd edition) lurray R. Spiegel: Schaum's Outline of Advanced Mathematics for Engineers and Scientists (McGraw-Hill				
Course Website		odle.hku.hk				

PHYS2155	Methods in physics II (6 credits)	Academic Year	2020				
Offering Department	Physics	Quota					
Course Co-ordinator	Dr K M Lee, Physics (kmlee@lily.physics.hku.hk)	Dr K M Lee, Physics (kmlee@lily.physics.hku.hk)					
Teachers Involved	(Dr K M Lee, Physics)						
Course Objectives	This is one of the second level courses in our series of courses that introduces problem solving, mathematical and computational skill sets that are commonly used in the study of university-level physics. Instead of the cookbook approach, we focus on training students how to think and work as physicists through tackling simple physics problems by both analytical and numerical means. After completion, interested students may take the other second level courses in this series PHYS2150 and/or PHYS2160 or the third level course in this series PHYS3150.						
Course Contents & Topics	This course introduces the principles and theories of various mathematical methods and skills that are essential for studying university physics. Topics include: matrices and vector spaces, systems of linear algebraic equations and systems of linear differential equations, Line integrals, surface integrals and volume integrals, Fourier analysis, and further numerical computation techniques in physics. Applications to physical systems and various practical						
Course Learning Outcomes	problems solving skills are discussed. Further MATLAB programming will be introduced and used in this course. On successful completion of this course, students should be able to: CLO 1 review the theory and principles of mathematical methods and compare the features of various methods CLO 2 describe the connections between mathematical equations and physical problems CLO 3 state and set up mathematical equations to describe the dynamics and evolution of physics systems CLO 4 demonstrate knowledge of choosing correct solution of mathematical equations CLO 5 solve various problems and operate the calculations with computer CLO 6 interpret and judge the physical meaning of result after calculations						
Pre-requisites (and Co-requisites	Pass in MATH1013 or MATH1821 or MATH1851 or PHYS1150						

and Impermissible combinations)						
Offer in 2020 - 2021	Y 2nd s	sem Offer in 2021 -	2022 : Y	Examination	n May	
Grade Descriptors (A+ to F)	'	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.				
	-	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	-	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	-	· · · · · · · · · · · · · · · · · · ·				
	Fail	Demonstrate little or no evor of analytical and critical	vidence of command of knowledge and sk abilities, logical and coherent thinking. S and presentational skills are minimally effect	lls required for attaining the cours show very little or no ability to a		
Course Type	Lecture-bas	sed course				
Course Teaching & Learning Activities	Activities		Details		No. of Hours	
	Lectures				36	
	Tutorials			12		
	Reading / Self study		80			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignmen	ts	Including computational assignments	20	CLO 1,2,3,4,5,6	
	Examinatio	n	2-hour written exam	50	CLO 2,3,4	
	Test			30	CLO 2,3,4	
Required/recommended reading and online materials	Lecture notes provided by Course Coordinator Susan J. Colley: Vector Calculus (Pearson, 2011, 4th edition) Allen B. Downey: Physical Modeling in MATLAB (Green Tea Press, 2008) Stephen W. Goode and Scott A. Annin: Differential Equations and Linear Algebra (Pearson, 2015, 4th edition) Joel Hass, Maurice D. Weir, and George B. Thomas Jr.: University Calculus: Early Transcendentals (Pearson, 2016, 3rd edition) David Poole: Linear Algebra: A Modern Introduction (Cengage Learning, 2015, 4th edition) K. F. Riley, M. P. Hobson, and S. J. Bence: Mathematical Methods for Physics and Engineering: A Comprehensive Guide (Cambridge University Press, 2006, 3rd edition) Murray R. Spiegel: Schaum's Outline of Advanced Mathematics for Engineers and Scientists (McGraw-Hill Education, 2009)					
		le.hku.hk				

PHYS2160	Introd	uctory computational physics (6 credits)	Academic Year	2020			
Offering Department	Physics		Quota	30			
Course Co-ordinator	Dr F K (Chow, Physics (judychow@hku.hk)					
Teachers Involved	(Dr F K	Chow,Physics)					
Course Objectives	This is one of the second level courses in our series of courses that introduces problem solving, mathematical and computational skill sets that are commonly used in the study of university-level physics. This course introduces computational tools, techniques, and methods in physics and related fields using the Python programming language. Students are expected to spend a substantial amount of time in writing computer programs to solve physical problems. After completion, interested students may take the sequel courses PHYS3151, PHYS4150 or PHYS4151 to further their studies in computational physics.						
Course Contents & Topics	oriented in scien numerio	Topics include: basics of computer programming; Python programming for physicists; introduction to object- oriented programming in Python; scientific programming with Matplotlib, NumPy, and SciPy; simple error analysis in scientific programming; solution of non-linear equations with application to projectile motion; Calculus and numerical methods with relevant examples in physics; numerical solution of ordinary differential equations with application to planetary motion.					
Course Learning	On succ	essful completion of this course, students should be able to:					
Outcomes	CLO 1 demonstrate knowledge in basic computational techniques and methods in physics						
	CLO 2 apply Python programming language and relevant packages to solve simple physical problems						
	CLO 3 employ appropriate numerical methods for solving ordinary differential equations that commonly arise in physics						
	CLO 4 review the numerical methods for simulation of various physical systems						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	MATH1013 or MATH1821 or MATH1851 or PHYS1150					
Offer in 2020 - 2021	Y 2	nd sem Offer in 2021 - 2022 : Y	Examination	May			
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advanced level of extensive kno learning outcomes. Show strong analytical and critical abilities and logic to apply knowledge to a wide range of complex, familiar and unfamilia presentational skills. Apply highly effective lab skills and techniques. Colinsightful conclusions.	al thinking, with evidence of original ar situations. Apply highly effective	al thought, and ability e organizational and			
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the cours learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familia and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques Correct use of data of results to draw appropriate conclusions.						
	С		ogical thinking, and ability to apply tational skills. Apply moderately el draw appropriate conclusions.	y knowledge to mos ffective lab skills and			
	D	techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.					

	of analytical and of problems. Organization	or no evidence of command of knowledge and critical abilitities, logical and coherent thinking ation and presentational skills are minimally ef es. Misuse of data and results and/or unable to	g. Show very little or no ability to ap fective or ineffective. Apply minimally of	oply knowledge to solve			
Course Type	Lecture with laboratory con	ecture with laboratory component course					
Course Teaching	Activities	Details		No. of Hours			
& Learning Activities	Lectures			32			
	Laboratory			18			
	Project work			12			
	Reading / Self study			64			
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Examination	2-hour written exam	50	CLO 1,2,3,4			
	Laboratory reports		20	CLO 1,2			
	Presentation		10	CLO 1,2,3,4			
	Project report		20	CLO 1,2,3,4			
Required/recommended reading and online materials	Christian Hills: Learning So Andi Klein and Alexander (Mark Newman: Computation Hans Petter Langtangen: A	Lecture notes provided by Course Coordinator Christian Hills: Learning Scientific Programming with Python (Cambridge University Press, 2016) Andi Klein and Alexander Godunov: Introductory computational physics (Cambridge University Press, 2010) Ark Newman: Computational Physics (CreateSpace Independent Publishing Platform, 2012) Alans Petter Langtangen: A Primer on Scientific Programming with Python (Springer, 2016, 5th edition) Alatt A. Wood: Python and Matplotlib Essentials for Scientists and Engineers (Morgan & Claypool, 2015)					
Course Website	http://moodle.hku.hk		.agee.e (organ a claypt	55., 25.5,			

PHYS2250	Introdu	ctory mechanics (6	credits)	Academic Yea	r 2020		
Offering Department	Physics	•	•	Quota			
Course Co-ordinator	Dr M K Y	ip, Physics (mankit@hk	ru.hk)				
Teachers Involved	(Dr M K \	/ip,Physics)					
Course Objectives	physics r fundame chemistry suppleme	This calculus-based course covers the foundation of Newtonian mechanics in one semester. It is a core course for physics major, a discipline elective for physics minor, as well as an elective course for those who want to learn fundamental Newtonian mechanics concepts and to link them up with their studies in fields like engineering chemistry and mathematics. Problem solving and analytical skills will be extensively used. They are supplemented by numerical skills occasionally. Upon completion, interested students may take PHYS3350 to continue their study in Lagrangian mechanics.					
Course Contents & Topics	Conserva Inertia, A Harmonia	Topics include: Kinematics, Newton's Laws of Motion and Their Applications, Linear Momentum and its conservation, Variable Mass Problems, System of Particles and Centre of Mass, Torque and Rotation, Moment or nertia, Angular Momentum and its Conservation, Work, Energy and its Conservation, Gravitation, Simple darmonic Motions, Damped and Driven Oscillations, Wave Equation, Energy in Wave Motion, Interference and the Principle of Superposition. On successful completion of this course, students should be able to:					
Course Learning	On succe	essful completion of this	course, students should be able	e to:			
Outcomes	CLO 1 d	escribe and explain the	fundamental physical principles	3			
	CLO 2 a	pply these principles, to	gether with logical and mathem	atical reasoning, to situations of	the physical worl		
	CLO 3 a	nalyse and solve proble	ms with the aids of mathematic	s			
	CLO 4 a	cquire and interpret exp	erimental data to examine the p	ohysical laws			
Pre-requisites and Co-requisites and Impermissible combinations)	Pass in F	Pass in PHYS1050 or PHYS1150 or PHYS1250 or ENGG1300					
Offer in 2020 - 2021	Y 1s	t sem 2nd sem Offer	r in 2021 - 2022 : Y	Examination	Dec May		
Grade Descriptors (A+ to F)	A	learning outcomes. Show to apply knowledge to a	strong analytical and critical abilities ar wide range of complex, familiar and u	ive knowledge and skills required for a d logical thinking, with evidence of orig unfamiliar situations. Apply highly effec ques. Critical use of data and results to	inal thought, and abili tive organizational ar		
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.					
	D						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lac of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solv problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective laskills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.						
Course Type		vith laboratory compone	nt course				
ourse Teaching	Activitie		Details		No. of Hours		
Learning Activities	Lectures						
	Laborato	•			6		
	Tutorials				12		
		/ Self study			80		
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm		Including computational assignments	10	CLO 1,2,3,4		
	Examina	tion	2-hour written exam	50	CLO 1.2.3		
		ory reports	E nour witten exam	15	CLO 1,4		

	Test		25	CLO 1,2,3	
Required/recommended	Lecture notes provided by Course Coordinator				
reading and	D. Kleppner and Robert J. Kolenkow: An Introduction to Mechanics (Cambridge University Press, 2013, 2nd edition)				
online materials	P.A Tipler and G. Mosca: Physics for Scientists and Engineers (Freeman, 2008, 6th edition)				
Course Website	http://moodle.hku.hk				

PHYS2255	Introduc	ctory electricity and	magnetism (6 credits)	Academic Yea	r 2020		
Offering Department	Physics			Quota			
Course Co-ordinator	Dr J C S I	Pun, Physics (jcspun@hi	ku.hk)				
Teachers Involved	(Dr J C S	Pun,Physics)					
Course Objectives	for physic fundamer chemistry by numer	This calculus-based course covers the foundation of electricity and magnetism in one semester. It is a core course for physics major, a discipline elective for physics minor, as well as an elective course for those who want to learn fundamental electricity and magnetism concepts and to link them up with their studies in fields like engineering chemistry and mathematics. Problem solving and analytical skills will be extensively used. They are supplemented by numerical skills occasionally. Upon completion, interested students may take PHYS3450 to further their study in electromagnetism.					
Course Contents	Topics in	opics include: electric force and electric field; Gauss' law and electric conductors; electric potential energy and					
& Topics			circuits; magnetic force; magne aw; Maxwell's equations; wave n				
Course Learning		On successful completion of this course, students should be able to:					
Outcomes			undamental physical principles				
	CLO 2 apply these principles, together with logical and mathematical reasoning, to situations of the physic						
			ns with the aids of mathematics				
			rimental data to examine the phy	/sical laws			
Pre-requisites and Co-requisites and Impermissible combinations)	Pass in P	H121030 01 PH121130	or PHYS1250 or ENGG1310				
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021 - 2	022 : Y	Examination	May		
Grade Descriptors (A+ to F)	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.						
	В	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lac of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective la skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.						
	Fall	of analytical and critical ab problems. Organization and	pilities, logical and coherent thinking. Some presentational skills are minimally effective.	show very little or no ability to appl tive or ineffective. Apply minimally eff	arning outcomes. Lack y knowledge to solve		
Course Type		of analytical and critical ab problems. Organization and	pilities, logical and coherent thinking. So presentational skills are minimally effect of data and results and/or unable to dra	show very little or no ability to appl tive or ineffective. Apply minimally eff	arning outcomes. Lac y knowledge to solve		
, .		of analytical and critical ab problems. Organization and skills and techniques. Misus vith laboratory componen	pilities, logical and coherent thinking. So presentational skills are minimally effect of data and results and/or unable to dra	show very little or no ability to appl tive or ineffective. Apply minimally eff	earning outcomes. Lac y knowledge to solve		
ourse Teaching	Lecture w	of analytical and critical at problems. Organization and skills and techniques. Misus- vith laboratory componen s	presentational skills are minimally effect of data and results and/or unable to dra t course	show very little or no ability to appl tive or ineffective. Apply minimally eff	earning outcomes. Lac y knowledge to solve ective or ineffective la		
ourse Teaching	Lecture w	of analytical and critical at problems. Organization and skills and techniques. Misus vith laboratory componen s	presentational skills are minimally effect of data and results and/or unable to dra t course	show very little or no ability to appl tive or ineffective. Apply minimally eff	varning outcomes. Lac y knowledge to solve ective or ineffective la		
Course Teaching	Lecture w	of analytical and critical at problems. Organization and skills and techniques. Misus vith laboratory componen s	presentational skills are minimally effect of data and results and/or unable to dra t course	show very little or no ability to appl tive or ineffective. Apply minimally eff	No. of Hours 36 6 12		
ourse Teaching	Lecture w Activities Lectures Laborato Tutorials	of analytical and critical at problems. Organization and skills and techniques. Misus vith laboratory componen s	presentational skills are minimally effect of data and results and/or unable to dra t course	show very little or no ability to appl tive or ineffective. Apply minimally eff	arning outcomes. Lac y knowledge to solve ective or ineffective la No. of Hours 36 6		
Course Teaching Learning Activities Assessment Methods	Lecture w Activities Lectures Laborato Tutorials	of analytical and critical ab problems. Organization and skills and techniques. Misus vith laboratory componen s ry	presentational skills are minimally effect of data and results and/or unable to dra t course	thow very little or no ability to applive or ineffective. Apply minimally effaw appropriate conclusions. Weighting in final course grade (%)	Anning outcomes. Lac y knowledge to solve ective or ineffective la No. of Hours 36 6 12		
Course Teaching & Learning Activities Assessment Methods	Lecture w Activities Lectures Laborato Tutorials Reading	of analytical and critical at problems. Organization and skills and techniques. Misus vith laboratory componen s	ilities, logical and coherent thinking. Sepresentational skills are minimally effected of data and results and/or unable to drate to course Details Details Including computational assignments	weighting in final course grade (%)	narning outcomes. Lac y knowledge to solve ective or ineffective la No. of Hours 36 6 12 80 Assessment Methods		
Course Teaching Learning Activities Assessment Methods	Lecture w Activities Lectures Laborato Tutorials Reading Methods Assignment	of analytical and critical at problems. Organization and skills and techniques. Misus vith laboratory componen s ry / Self study ents tion	presentational skills are minimally effect of data and results and/or unable to drate to course Details Details Including computational	weighting in final course grade (%) Weighting in final course grade (%) 10 50	No. of Hours 36 6 12 80 Assessment Methods to CLO 1,2,3,4 CLO 1,2,3		
Course Teaching Learning Activities Assessment Methods	Lecture w Activities Lectures Laborato Tutorials Reading Methods Assignment Examinat Laborato	of analytical and critical at problems. Organization and skills and techniques. Misus vith laboratory componen s ry / Self study ents	ilities, logical and coherent thinking. Sepresentational skills are minimally effected of data and results and/or unable to drate to course Details Details Including computational assignments	weighting in final course grade (%) Weighting in final course grade (%) 10 50 15	No. of Hours 36 6 12 80 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,4		
Course Teaching & Learning Activities Assessment Methods	Lecture w Activities Lectures Laborato Tutorials Reading Methods Assignme Examinal Laborato Test	of analytical and critical at problems. Organization and skills and techniques. Misus vith laboratory componen s ry / Self study ents tion ry reports	presentational skills are minimally effect of data and results and/or unable to drat tocurse Details	weighting in final course grade (%) Weighting in final course grade (%) 10 50 15 25	No. of Hours 36 6 12 80 Assessment Methods to CLO 1,2,3,4 CLO 1,2,3		
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and conline materials	Lecture w Activities Lectures Laborato Tutorials Reading Methods Assignme Examinat Laborato Test P. A. Tiple R. D. Knig R. Resnic	of analytical and critical ab problems. Organization and skills and techniques. Misus vith laboratory componen s ry / Self study ents tion ry reports er and G. Mosca: Physica ght: Physics for Scientists ck, D. Halliday, and K. Kra	ilities, logical and coherent thinking. Sepresentational skills are minimally effected of data and results and/or unable to drate to course Details Details Including computational assignments	Weighting in final course grade (%) 10 50 15 25 reeman, 2008, 6th edition) ley and Sons, 2002, 5th editio	No. of Hours No. of Hours 36 6 12 80 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3 CLO 1,4 CLO 1,2,3		

PHYS2260	Heat and waves (6 credits)	Academic Year	2020
Offering Department	Physics	Quota	
Course Co-ordinator	Dr M Su, Physics (mengsu84@hku.hk)		
Teachers Involved	(Dr M Su,Physics)		
Course Objectives	This course covers the foundation of heat and waves in one semester. It serves are planning to take physics, astronomy, or mathematics/physics as major. It a take physics as minor. Both conceptual ideas and mathematical treatment in hea	lso serves studer	nts who intend to
Course Contents & Topics	Topics include: type of waves; Sinusoidal wave including transverse velocity and a stretched string as an example for transverse wave, Sound wave as an example equation, Energy in wave motion, The principle of superposition, Interference resonance, Beats, The Doppler Effect, Light wave as an electromagnetic wave, interference, Interference from thin films, Single slit diffraction, Multiple slit and	imple for longitud e of waves, Stan Reflection, Refra	inal wave, Wave ding waves and action, Double sli

Course Learning	energy, gas, Mo including entropy	and equilibrium, Ideal gas law, Molecular view of pressure, Mean free path, distributions of molecular speed and energy, Concept of heat, First law of thermodynamic, Work done on or by an ideal gas, Internal energy of an ideal gas, Molar heat capacities at constant volume and constant pressure, Different thermodynamic processes including adiabatic, isothermal, constant-volume, cyclical and free expansion, Reversibility of process, definition of entropy change, The second law of thermodynamic, Carnot engine, Statistical view of entropy. On successful completion of this course, students should be able to: CLO 1 describe and explain the fundamental physical principles					
Outcomes	CLO 2 CLO 3	CLO 2 apply these principles, together with logical and mathematical reasoning, to situations of the physical wo CLO 3 analyse and solve problems with the aids of mathematics CLO 4 acquire and interpret experimental data to examine the physical laws					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in PHYS1050 or PHYS1250						
Offer in 2020 - 2021	N C	Offer in 2021 - 2022 : N		Examination			
Grade Descriptors (A+ to F)	Α	learning outcomes. Show s to apply knowledge to a w	trong analytical and critical abilities ride range of complex, familiar and	ensive knowledge and skills required for and logical thinking, with evidence of or d unfamiliar situations. Apply highly effe iniques. Critical use of data and results	iginal thought, and ability ective organizational and		
	В						
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.						
Course Type	Lecture	with laboratory componer	nt course				
Course Teaching	Activiti		Details		No. of Hours		
& Learning Activities	Lecture			36 6			
	Labora						
	Tutorial				8		
Assessment Methods		g / Self study	D. (. !!.	M. 1. 1. C 1. C 1	80		
and Weighting	Method	as	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignr			10	CLO 1,2,3,4		
	Examin		2-hour written exam	50	CLO 1,2,3		
		tory reports		15	CLO 1,4		
	Test			25	CLO 1,2,3		
Required/recommended reading and online materials	R. Resn	nick, D. Halliday, and K. Kr	rane: Physics Volume 1 (Joh	rs (Freeman, 2008, 6th edition) n Wiley and Sons, 2002, 5th edit n Wiley and Sons, 2002, 5th edit			

PHYS2261	Introduc	ctory heat	and thermod	dynamics (6	credits)		Academic Year	2020
Offering Department	Physics						Quota	
Course Co-ordinator	Dr S Z Zh	hang, Physics	(shizhong@hk	ku.hk)				
Teachers Involved	(Dr S Z ZI	hang,Physics	s)					
Course Objectives	course for learn fund chemistry suppleme	or physics maj ndamental the y and math ented by nun	or, a discipline ermodynamics ematics. Proble	elective for ph concepts and em solving a ccasionally. U	ysics minor, as w to link them up and analytical pon completion,	well as an ele o with their : skills will b		ised. They are
Course Contents & Topics	and equa	ation of state and second la	and state trainal aw of thermody	nsformation; f ynamics; vario	rst law of thern ous thermodynar	nodynamics, mic potential	adiabatic proces s and their appli	nic state function is, Carnot cycle; cations in phase cussion on kinetic
Course Learning Outcomes	CLO 1 de CLO 2 ap CLO 3 ar	describe and e apply these pri analyse and so	explain the fund inciples, togethe olve problems v	lamental physi er with logical with the aids of	and mathematic	al reasoning,	to situations of th	ne physical world
Pre-requisites (and Co-requisites and Impermissible combinations)			PHYS1150 or F					
Offer in 2020 - 2021	Y 1st	t sem Offer	in 2021 - 2022	: Y			Examination	Dec
Grade Descriptors (A+ to F)	A	learning outco	omes. Show strong vledge to a wide r I skills. Apply high	g analytical and cr range of complex	itical abilities and loo , familiar and unfam	gical thinking, w niliar situations.	skills required for atta ith evidence of origina Apply highly effective data and results to d	al thought, and ability e organizational and
	В						d for attaining at leas g, and ability to apply	t most of the course knowledge to familiar

			ons. Apply effective organizational and press to draw appropriate conclusions.	resentational skills. Apply effective	e lab skills and techniques.		
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.					
	Fail	of analytical and critical at problems. Organization and	dence of command of knowledge and ski bilities, logical and coherent thinking. S presentational skills are minimally effect se of data and results and/or unable to dra	show very little or no ability to stive or ineffective. Apply minimally	apply knowledge to solve		
Course Type	Lecture w	ith laboratory componen	it course				
Course Teaching	Activities	3	Details		No. of Hours		
& Learning Activities	Lectures			36			
	Laboratory			6			
	Tutorials			12			
	Reading / Self study				80		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		Including computational assignments	10	CLO 1,2,3,4		
	Examinat	ion	2-hour written exam	50	CLO 1,2,3,4		
	Laborator	ry reports		15	CLO 3		
	Test			25	CLO 1,2,3,4		
Required/recommended reading and		otes provided by Course I. Blundell and Katherine	Coordinator M. Blundell, Concepts in Therm	al Physics, Oxford Univers	ity Press, 2010		
online materials	Herbert B	. Callen, Thermodynami	cs and an Introduction to Thermo	statistics, John Willey & So	ons, Inc. (1985)		
Course Website	http://moo	dle.hku.hk					

PHYS2265	Introdu	ctory quantum phys	sics (6 credits)	Academic Ye	ar 2020		
Offering Department	Physics		,	Quota			
Course Co-ordinator	Dr F K Cl	now, Physics (judychow	@hku.hk)				
Teachers Involved	(Dr F K C	Chow,Physics)					
Course Objectives	physics r fundamer mathema skills occ	This calculus-based course covers the foundation of quantum physics in one semester. It is a core course for physics major, a discipline elective for physics minor, as well as an elective course for those who want to lear fundamental quantum physics and to link them up with their studies in fields like engineering, chemistry an mathematics. Problem solving and analytical skills will be extensively used. They are supplemented by numeric skills occasionally. Upon completion, interested students may take PHYS3351 to further their study in quantum mechanics.					
Course Contents & Topics	waves; th	ne Schrodinger equation		netic waves behaving as particles; ependent Schrodinger equation to be electron atoms.			
Course Learning			course, students should I				
Outcomes			fundamental physical prir				
				athematical reasoning, to situations o	f the physical world		
	CLO 3 a	nalyse and solve proble	ms with the aids of mathe	ematics	. ,		
		· · · · · · · · · · · · · · · · · · ·	erimental data to examin				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in P	PHYS1050 or PHYS1150	or PHYS1250 or ENGG	1300			
Offer in 2020 - 2021	Y 1st	t sem 2nd sem Offer	in 2021 - 2022 : Y	Examination	Dec May		
Grade Descriptors (A+ to F)	A	learning outcomes. Show to apply knowledge to a presentational skills. Apply insightful conclusions.	strong analytical and critical ab wide range of complex, familia / highly effective lab skills and	extensive knowledge and skills required for illities and logical thinking, with evidence of original under and unfamiliar situations. Apply highly effect techniques. Critical use of data and results to transludge, and skills required for attaining at land.	ginal thought, and ability ctive organizational and o draw appropriate and		
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.					
	D						
	Fail						
Course Type	Lecture w	vith laboratory compone	nt course				
Course Teaching	Activitie	S	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Laborato	ry			6		
	Tutorials				12		
	Reading	/ Self study			80		
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods		

	Assignments	Including computational assignments	10	CLO 1,2,3,4
	Examination	2-hour written exam	50	CLO 1,2,3
	Laboratory reports		15	CLO 1,4
	Test		25	CLO 1,2,3
Required/recommended reading and online materials	Lecture notes provided by Course Robert Eisberg and Robert Resni Wiley & Sons, 1985) Randy Harris: Modern Physics (Pe Kenneth S. Krane: Modern Physics Raymond A. Serway, Clement J. N Paul A. Tipler and Gene Mosca: Company, 2008, 6th edition)	ck: Quantum Physics of Atoms, earson, 2014, 2nd edition) s (John Wiley & Sons, 2012, 3rd of Moses, and Curt A. Moyer: Moder	edition) n Physics (Cengage Learni	ing, 2005, 3rd edition)
Course Website	http://moodle.hku.hk			

PHYS2650	Modern	astronomy (6 credit	ts)	Academic Ye	ar 2020		
Offering Department	Physics			Quota			
Course Co-ordinator		im, Physics (jjlim@hku.h	nk)				
Teachers Involved		Lim,Physics)					
Course Objectives	course in advances the recer PHYS365	This is an intermediate course in astronomy for students in all disciplines and all years. This is also the seccourse in our series of two compulsory courses to introduce basic astronomy knowledge, methods and reciplination advances for astronomy minor. This course aims at deepening student knowledge of astronomy, with emphasis the recent discoveries and modern techniques. After completing this course, interested students may tale PHYS3650, PHYS3653 and/or PHYS3660, which are core or discipline elective courses for astronomy minor a astrophysics theme of physics major.					
Course Contents & Topics	Topics inc	Topics include: exoplanets; general relativity; gravitational waves; neutrinos in astronomy; stellar physics; garay bursts; inflation and cosmology.					
Course Learning	On succe						
Outcomes	CLO 1	recall the various detec	ction techniques of exoplanets	3			
	CLO 2	state the basic ideas of	f general relativity and gravita	tional waves			
	CLO 3	describe the significand	ce of neutrinos physics in astr	ronomy			
	CLO 4	recall the different aspe	ects of gamma-ray bursts				
	CLO 5	explain the principles of	f inflation and how it solves p	roblems in cosmology			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in P	HYS1650					
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021 - 2	2022 : Y	Examination	May		
Grade Descriptors (A+ to F)	Α	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
•		to apply knowledge to a wing presentational skills.	ide range of complex, familiar and	unfamiliar situations. Apply highly effe	ective organizational and		
•	В	to apply knowledge to a wi presentational skills. Demonstrate substantial col learning outcomes. Show ev and some unfamiliar situatio Demonstrate general but in	ide range of complex, familiar and mmand of a broad range of knowle vidence of analytical and critical abilitions. Apply effective organizational an ncomplete command of knowledge	unfamiliar situations. Apply highly effedge and skills required for attaining at ties and logical thinking, and ability to apid presentational skills. and skills required for attaining most	ective organizational and least most of the course oply knowledge to familian		
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PHYS2850	Atomic and nuclear physics (6 credits)	Academic Year	2020			
Offering Department	Physics	Quota				
Course Co-ordinator	Dr S Z Zhang, Physics (shizhong@hku.hk)					
Teachers Involved						
Course Objectives	This course will introduce students to the fundamentals of atomic physics and ruto provide a coherent and concise coverage of traditional atomic and nuclear presearch interest will be also discussed, such as laser cooling and trapping wherealization of Bose-Einstein condensate in atomic vapors.	hysics. Important	topics of current			
Course Contents & Topics	Topics include: Atomic structure of hydrogen and hydrogen-like atom, multi-electifield, spectroscopy, laser trapping and cooling; nuclear structure, shell model an					

Course Learning			nd nuclear physics will be mentioned when appropriate.					
•		•						
Outcomes		apply general consideration		o atomic and nuclear system; mak	ke general orders of			
	CLO 2 explain how light interacting with atom; the working principle of laser trapping and cooling							
	CLO 3 recognize the general features of atomic/nuclear spectroscopy							
	CLO 4 apply quantum physics to understand the basic features of simple nuclei, binding of deuteron et al							
Pre-requisites		Pass in PHYS2265						
(and Co-requisites and Impermissible combinations)	1 433 1111							
Offer in 2020 - 2021	N O	ffer in 2021 - 2022 : N		Examination				
Grade Descriptors (A+ to F)	Α	learning outcomes. Show to apply knowledge to a	strong analytical and critical abiliti wide range of complex, familiar a	ktensive knowledge and skills required for es and logical thinking, with evidence of or and unfamiliar situations. Apply highly effect ichniques. Critical use of data and results	riginal thought, and ability ective organizational and			
	В	learning outcomes. Show and some unfamiliar situat	evidence of analytical and critical a tions. Apply effective organizations	wledge and skills required for attaining at abilities and logical thinking, and ability to a al and presentational skills. Apply effective s	pply knowledge to familia			
	С	Correct use of data of results to draw appropriate conclusions. Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.						
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.							
	Fail	lab skills and techniques. I Demonstrate little or no ev of analytical and critical problems. Organization ar	imited ability to use data and resuridence of command of knowledge abilities, logical and coherent thing presentational skills are minima		s. Apply partially effective e learning outcomes. Lack pply knowledge to solve			
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Course Teaching	Lecture-l	lab skills and techniques. I Demonstrate little or no ev of analytical and critical problems. Organization ar skills and techniques. Misu based course	imited ability to use data and resu irdence of command of knowledge abilities, logical and coherent thi do presentational skills are minima use of data and results and/or unal	ilts to draw appropriate conclusions. and skills required for attaining the course nking. Show very little or no ability to a lly effective or ineffective. Apply minimally	s. Apply partially effective e learning outcomes. Lack pply knowledge to solve effective or ineffective lab No. of Hours			
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Course Teaching & Learning Activities Assessment Methods	Lecture-lectures Lectures Tutorials Reading	lab skills and techniques. I Demonstrate little or no ev of analytical and critical problems. Organization ar skills and techniques. Misu based course es s s g / Self study s	imited ability to use data and resultidence of command of knowledge abilities, logical and coherent thind presentational skills are minimause of data and results and/or unatable. Details	Ilts to draw appropriate conclusions. and skills required for attaining the course nking. Show very little or no ability to a ly effective or ineffective. Apply minimally ole to draw appropriate conclusions. Weighting in final	s. Apply partially effective elearning outcomes. Lack pply knowledge to solve effective or ineffective late No. of Hours 36 18 80 Assessment Methods			
Course Teaching Learning Activities Assessment Methods	Lecture-I Activitie Lectures Tutorials Reading Method	lab skills and techniques. I Demonstrate little or no ev of analytical and critical problems. Organization ar skills and techniques. Misu based course es s s g / Self study s ments	imited ability to use data and resultidence of command of knowledge abilities, logical and coherent thind presentational skills are minimause of data and results and/or unatable. Details	Ilts to draw appropriate conclusions. and skills required for attaining the course nking. Show very little or no ability to a glilly effective or ineffective. Apply minimally tole to draw appropriate conclusions. Weighting in final course grade (%)	s. Apply partially effective e learning outcomes. Lack pply knowledge to solve effective or ineffective late No. of Hours 36 18 80 Assessment Methods to CLO Mapping			
Course Teaching & Learning Activities Assessment Methods	Lecture-l Activitie Lectures Tutorials Reading Method:	lab skills and techniques. I Demonstrate little or no ev of analytical and critical problems. Organization ar skills and techniques. Misu based course es s s g / Self study s ments	imited ability to use data and resultidence of command of knowledge abilities, logical and coherent thind presentational skills are minimause of data and results and/or unatable. Details	Ilts to draw appropriate conclusions. and skills required for attaining the course nking. Show very little or no ability to all ly effective or ineffective. Apply minimally tole to draw appropriate conclusions. Weighting in final course grade (%)	s. Apply partially effective e learning outcomes. Laci pply knowledge to solve effective or ineffective lal No. of Hours 36 18 80 Assessment Methods to CLO Mapping CLO 1,2,3,4			
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Lecture-l Activitie Lectures Tutorials Reading Method Assignm Examina Test Lecture r W. Demt K. Krane	lab skills and techniques. I Demonstrate little or no ev of analytical and critical problems. Organization ar skills and techniques. Mist based course es s s g / Self study ls nents attion notes provided by Cours troder, Atoms, molecules e, Introductory nuclear ph	imited ability to use data and resuldence of command of knowledge abilities, logical and coherent thind presentational skills are minimaluse of data and results and/or unatable Details Details Details Details Coordinator and photons (Springer, 2n pysics (John Wiley & Sons,	Ilts to draw appropriate conclusions. and skills required for attaining the course skills required for attaining the course of	s. Apply partially effective e learning outcomes. Lac pply knowledge to solve effective or ineffective la No. of Hours 36 18 80 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4			

PHYS3150	Theoreti	ical physics (6	credits)		Academic Year	2020	
Offering Department	Physics				Quota		
Course Co-ordinator	Dr C J Wa	ang, Physics (cjwa	ng @hku.hk)				
Teachers Involved	(Dr C J W	ang,Physics)					
Course Objectives	computation and compan elective	onal skill sets that outer algebra techn e course for the co	are commonly used in iques in solving physion pmputational physics a	courses that introduces p the study of university-level is problems. It is one of the and theoretical physics them in mathematical and theoret	physics. We focus core electives for p es. This is also an	on the analytical on the analy	
Course Contents & Topics	application differentia singular p Bessel fur	ns (Cauchy's integ al equations commo points); (iii) Proper nctions, spherical	ral formula, calculus only appears in physic ties of special function harmonics etc.), (iv) li	owing topics: (i) Functions f residues, etc); (ii) Advance s (such as series solution, son swidely used in Physics tegral transforms (Fourier to tical problems appearing in	d methods in solvir econd solution, Gre (Gamma functions ransforms and Lap	ng and classifyir en's function, ar , Beta functions	
Course Learning	On succes	ssful completion of	this course, students	should be able to:			
Outcomes	CLO 1 ar	nalyse and examin	e the analytical proper	ies of complex functions			
	CLO 2 ca	alculate various def	finite integrals using th	e method of residues			
	CLO 3 ar	nalyse and solve ty	pical partial differentia	equations			
	CLO 4 ap	oply the special fun	ctions in handling vari	ous physical problems			
	CLO 5 use the Fourier series and Fourier transform in analysing periodic functions and waves, and understand the basics of Laplace transforms						
	CLO 6 use Mathematica to solve simple analytical problems in physics						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	IATH2211 or PHYS	S2150 or PHYS2155				
Offer in 2020 - 2021	Y 2nd	d sem Offer in 20	21 - 2022 : Y		Examination	May	
Grade Descriptors (A+ to F)	A	learning outcomes. S to apply knowledge presentational skills.	Show strong analytical and to a wide range of comple	l level of extensive knowledge an critical abilities and logical thinking, x, familiar and unfamiliar situation	with evidence of originals. Apply highly effective	al thought, and abili e organizational an	
	В	learning outcomes. S	show evidence of analytical	ange of knowledge and skills requ and critical abilities and logical think ganizational and presentational ski	ting, and ability to apply		

	С	outcomes. Show evidence of		ge and skills required for attaining mo lities and logical thinking, and ability to nd presentational skills.			
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	3	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading /	Self study		80			
Assessment Methods and Weighting	Methods	·	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		Including computational assignments	al 30	CLO 1,2,3,4,5,6		
	Examinat	ion	3-hour written exam	60	CLO 1,2,3,4,5		
	Test			10	CLO 1,2,3,4,5		
Required/recommended reading and online materials		otes provided by Course and H. Weber: Mathema	Coordinator atical Methods for Physicists	s (Academic Press, 2005)			

PHYS3151	Machine learning in physics (6 credits) Acad				Academic Ye	ar 2020		
Offering Department	Physics		, ,			Quota		
Course Co-ordinator		leng, Physics (zyr	neng @hku.hk)					
Teachers Involved	(Dr Z Y N	Meng,Physics)	,					
Course Objectives	Machine	learning is a tecl	hnique that enables	computers to lea	rn without b	eing explicitly "pro	grammed". It is	
•	Machine learning is a technique that enables computers to learn without being explicitly "programmed". It is ar essential part of big data science and has been widely used in different fields of physics. This course introduces							
	the basics of machine learning, from key concepts to practical algorithms, with a focus on real-world applications in							
	physics. It is an elective course for the computational physics theme. This is also an essential course for those who plan to apply machine learning techniques in their postgraduate studies or in their future work.							
Course Contents	Machine learning software packages in Python, Supervised and Unsupervised learning, Regression, Classification, Principal component analysis, Singular value decomposition, Support vector machines, Clustering, K-Nearest							
& Topics		•	,				•	
	Neighbors, Decision trees, Neural Networks, Deep Learning, Application of machine with examples drawing from fields such as astrophysics, particle physics and complex							
Course Learning			of this course, studen			complex systems.		
Outcomes		•	ledge in essential me			achine learning ar	nd its application	
		physics	icage in essential file	cirious and teem	ilques ioi ili	acrime learning an	id its application	
		•	es of machine learnin	g in data analysis	s			
			ne learning packages					
			tten and verbal comm			presentation		
Pre-requisites			TH2101 or MATH221					
and Co-requisites			non is needed (please					
and Impermissible			ν,			,		
combinations)								
Offer in 2020 - 2021	Y 1s	st sem Offer in 2	021 - 2022 : Y			Examination	Dec	
Grade Descriptors	Α	Demonstrate thord	ough mastery at an advan	ced level of extensi	ve knowledae	and skills required for	attaining all the co-	
(A+ to F)								
			. Show strong analytical ar	nd critical abilities an	d logical thinkir	ng, with evidence of original	ginal thought, and a	
(A+ 10 F)		to apply knowledg	. Show strong analytical ar e to a wide range of com	nd critical abilities an nplex, familiar and u	d logical thinkir nfamiliar situati	ng, with evidence of originals. Apply highly effections.	ginal thought, and a ctive organizational	
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Course Type Course Teaching & Learning Activities Assessment Methods	Fail Lecture v Activitie Lectures Laborato Tutorials Reading Method	to apply knowledg presentational skill insightful conclusion. Demonstrate subs learning outcomes and some unfamilia Correct use of data Demonstrate gene outcomes. Show e familiar situations. techniques. Mostly Demonstrate partices show evidence of knowledge to solvelab skills and technique of analytical and problems. Organiz skills and technique with laboratory cores.	Show strong analytical are to a wide range of comes. Apply highly effective laws. Itantial command of a broad street of a street of analytical are situations. Apply effective a of results to draw approprial but incomplete commended of some analytical apply moderately effective correct but some erroneou. If but limited command of some coherent and logical e problems. Apply limited igues. Limited ability to use or no evidence of comman critical abilities, logical an attoin and presentational sies. Misuse of data and resumponent course Details	nd critical abilities an uplex, familiar and u ab skills and techniq d range of knowledgal and critical abilities organizational and iate conclusions. and of knowledge al and critical abilities organizational and is use of data and reknowledge and skills thinking, but with limor barely effective or edata and results to d of knowledge and d coherent thinking, ills are minimally effults and/or unable to	d logical thinkir nfamiliar situati uses. Critical us ge and skills res is and logical th presentational and skills requi is and logical th presentational sults to draw ap a required for at ited analytical a ganizational ar draw appropria skills required fi. Show very lite ective or ineffer draw appropria	ng, with evidence of orions. Apply highly effere or data and results to quired for attaining at I inking, and ability to ap skills. Apply effective lared for attaining most inking, and ability to a pskills. Apply moderatel by propriate conclusions. Itaining some of the coand critical abilities. She did presentational skills. Ite conclusions. The conclusions or attaining the course the or no ability to apptive. Apply minimally election conclusions.	ginal thought, and a citive organizational organizational organizational organizational organizational organizational organizational organizational organizational organizational of the course learn poly knowledge to represent the course learn poly knowledge to represent the course learn poly knowledge to represent the course learning outcomes with the course learning outcomes. It is a course learning outcomes.	

online materials	T. Hastie, R. Tibshirani, & J. Friedman, The Elements of Statistical Learning, 2nd ed., Springer (2016) S. Raschka, Python Machine Learning, 2nd ed., Packt Publishing (2017)
Course Website	http://moodle.hku.hk

PHYS3350	Classica	al mechanics (6	credits)	Academic Year	2020		
Offering Department	Physics			Quota			
Course Co-ordinator	Prof S Q	Prof S Q Shen, Physics (sshen@hku.hk)					
Teachers Involved	(Prof S Q	Shen, Physics)					
Course Objectives	This course covers Lagrangian mechanics in the advanced undergraduate level with rigorous mathematical treatment. It is one of the core electives for physics major and an elective course for the theoretical physics theme. This is also an essential course for those who plan to pursue postgraduate studies in physics or relate disciplines. Problem solving and analytical skills will be extensively used. They are supplemented by numerical skills occasionally.						
Course Contents & Topics	This course will be essentially divided into two parts. In the first part, fundamental concepts related to Lagrangian mechanics will be treated. Topics include the variational principle, conservation laws and its relation to Newtonian mechanics. In the second part, we shall discuss applications of the Lagrangian mechanics. Topics include the central force problem, the coupled harmonic oscillators and rigid-body dynamics. Lagrangian mechanics in not inertial frame will also be discussed.						
Course Learning Outcomes	CLO 1 ur	nderstand the log ormulation;	this course, students should be able tical structure of Lagrangian mecha	nics and its advantage over			
	Ca	ases	of Lagrangian for a mechanical syst		uations in simple		
Pre-requisites		nderstand the conr HYS2150 and PH\	ection between classical mechanics a	id other mechanics			
rre-requisites (and Co-requisites and Impermissible combinations)	Pass in P	m (52 150 and Pm)	(\$2250				
Offer in 2020 - 2021	Y 1st	sem Offer in 202	21 - 2022 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lac of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solv problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-b	ased course					
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading / Self study				80		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods o CLO Mapping		
	Assignments		Including computational assignments	20	CLO 1,2,3		
	Examinat	tion	3-hour written exam	60	CLO 1,2,3		
	Test			20	CLO 1,2,3		
Required/recommended reading and online materials	S. T. Tho	rnton and J. B. Mai	rion, Classical Dynamics (Thomson, 20	004)			

PHYS3351	Quantum mechanics (6 credits)	Academic Year	2020			
Offering Department	Physics	Quota				
Course Co-ordinator	Prof W Yao, Physics (wangyao@hku.hk)					
Teachers Involved	(Prof W Yao, Physics)					
Course Objectives	This course covers the basics of quantum mechanics in the advanced mathematical treatment. It is one of the core electives for physics major and a physics theme. This is also an essential course for those who plan to pursue related disciplines. Problem solving and analytical skills will be extensively numerical skills occasionally. Upon completion, interested students may take further their studies in quantum mechanics.	n elective course to postgraduate studused. They are s	for the theoretica dies in physics of supplemented by			
Course Contents & Topics	Time-dependent Schrodinger equation; statistical interpretation of wave function; probability density; probability current and continuity equation; momentum; physical observable and expectation value; Heisenberg uncertainty principle; time-independent Schrodinger equation; Hamiltonian and stationary states; particle in a square well transmission and reflection at a barrier; harmonic oscillator problem using ladder operators; free particle and wavepacket; delta function potential; Dirac notations; state vectors; Hilbert space; Hermitian operators; eigenstate and eigenvalues; generalized statistical interpretation; generalized uncertainty principle; angular momentum; hydrogen atom; atomic orbits; spin; non-degenerate perturbation theory.					
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 describe the statistical interpretation of quantum mechanical systems and uncertainty of physical observables	, and calculate ex	pectation values			

	CLO 2 formulate energy eigenvalue problems, and solve them in examples where potentials have simple analytical forms						
	CLO 3 formulate time evolution of the wavefunction and the expectation value of physical observables with known energy eigenfunctions						
	CLO 4 j	udge the applicability	of time-independent perturbation turbations applied to the physical s		mulate leadi	ng order energy	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	Pass in PHYS2150 and PHYS2265, knowledge of PHYS2155 will be advantageous					
Offer in 2020 - 2021	Y 19	st sem Offer in 2021 - :	2022 : Y	Ex	amination	Dec	
Grade Descriptors (A+ to F)	A	learning outcomes. Show	astery at an advanced level of extensive strong analytical and critical abilities and I wide range of complex, familiar and unfa	ogical thinking, with e	vidence of origin	nal thought, and ability	
	В	·					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture-	based course					
Course Teaching	Activiti	es	Details			No. of Hours	
& Learning Activities	Lecture	S				36	
	Tutorial	S				12	
	Reading	g / Self study				80	
Assessment Methods and Weighting	Method	s	Details	Weighting i course grad	de (%)	Assessment Methods to CLO Mapping	
	Assignn	nents	Including computational assignments	20		CLO 1,2,3,4	
	Examination		2-hour written exam	60		CLO 1,2,3,4	
	LAGITIIII						
	Test			20		CLO 1,2,3,4	
Required/recommended reading and online materials	Test Lecture	notes provided by Cours ffiths: Introduction to Qu	e Coordinator antum Mechanics (Pearson Prenti		d ed.)	CLO 1,2,3,4	

	Electror	magnetism (6 cred	lits)		Academic Year	2020	
Offering Department	Physics	Physics Quota					
Course Co-ordinator	Prof X D	Cui, Physics (xdcui@l	nku.hk)				
Teachers Involved	(Prof X D	Cui, Physics)	,				
Course Objectives	mathema physics the related dinumerical	This course covers the basics of electromagnetism at the advanced undergraduate level with vigorous mathematical treatment. It is one of the core electives for physics major and an elective course for the theoretical physics theme. This is also an essential course for those who plan to pursue postgraduate studies in physics or related disciplines. Problem solving and analytical skills will be extensively used. They are supplemented by numerical skills occasionally. Upon completion, interested students may take the sequel course PHYS4450 to further their studies in electromagnetism.					
Course Contents & Topics		s, magnetostatics an	vectors, electric fields and electromagnetic indu				
Course Learning	On succe	ssful completion of the	s course, students should	be able to:			
Outcomes	CLO 1 identify the fundamental physics in electrostatics and magnetism						
	CLO 2 apply mathematical tools to describe electrostatics and magnetism						
	CLO 3 use the Maxwell's equations to explain various electrostatic and magnetic phenomena						
	CLO 4 differentiate between electrostatics in vacuum and in dielectric materials						
	CLO 5 differentiate between magnetism in vacuum and in magnetic materials						
Pre-requisites (and Co-requisites and Impermissible	Pass in P	Pass in PHYS2150 and PHYS2255, knowledge of PHYS2155 will be advantageous					
	Y 2nd	d sem Offer in 2021	- 2022 : Y		Examination	May	
combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Y 2nd	Demonstrate thorough r learning outcomes. Show	- 2022 : Y mastery at an advanced level v strong analytical and critical a wide range of complex, fam	abilities and logical thinking, w	skills required for atta ith evidence of origina	aining all the course al thought, and ability	
Offer in 2020 - 2021 Grade Descriptors		Demonstrate thorough r learning outcomes. Show to apply knowledge to a presentational skills. Demonstrate substantial learning outcomes. Show	nastery at an advanced level v strong analytical and critical	abilities and logical thinking, w liar and unfamiliar situations. Knowledge and skills require cal abilities and logical thinking	skills required for atta ith evidence of origina Apply highly effective d for attaining at leas g, and ability to apply	aining all the course al thought, and ability e organizational and at most of the course	
Offer in 2020 - 2021 Grade Descriptors	A	Demonstrate thorough r learning outcomes. Show to apply knowledge to a presentational skills. Demonstrate substantial learning outcomes. Show and some unfamiliar situ Demonstrate general bu outcomes. Show eviden familiar situations. Apply	nastery at an advanced level v strong analytical and critical a wide range of complex, fam command of a broad range o v evidence of analytical and crit ations. Apply effective organiza it incomplete command of kn ce of some analytical and criti moderately effective organizati	abilities and logical thinking, whiliar and unfamiliar situations. Knowledge and skills require cal abilities and logical thinking tional and presentational skills obwledge and skills required for all abilities and logical thinking and land presentational skills.	skills required for attaith evidence of original Apply highly effective of for attaining at least g, and ability to apply or attaining most of g, and ability to apply and ability to apply to apply the formula of the	aining all the course al thought, and abilite e organizational and at most of the course knowledge to familia the course learning y knowledge to mos	
Offer in 2020 - 2021 Grade Descriptors	В	Demonstrate thorough r learning outcomes. Show to apply knowledge to a presentational skills. Demonstrate substantial learning outcomes. Show and some unfamiliar situ Demonstrate general bu outcomes. Show eviden familiar situations. Apply Demonstrate partial but Show evidence of some	nastery at an advanced level v strong analytical and critical a wide range of complex, fam command of a broad range o v evidence of analytical and crit ations. Apply effective organiza t incomplete command of kn ce of some analytical and criti	abilities and logical thinking, whilar and unfamiliar situations. knowledge and skills require cal abilities and logical thinkinitional and presentational skills by by by by by by by by by by by by by	skills required for attaith evidence of original Apply highly effective of for attaining at least, and ability to apply or attaining most of g, and ability to apply apply some of the course ritical abilities. Show least the course of the course ritical abilities.	aining all the course al thought, and ability e organizational and at most of the course knowledge to familia the course learning y knowledge to mos e learning outcomes	
Offer in 2020 - 2021 Grade Descriptors	B C	Demonstrate thorough r learning outcomes. Show to apply knowledge to presentational skills. Demonstrate substantial learning outcomes. Show eviden familiar situations. Apply Demonstrate general bu outcomes. Show eviden familiar situations. Apply Demonstrate partial but Show evidence of some knowledge to solve prob Demonstrate little or no of analytical and critica	nastery at an advanced level v strong analytical and critical a wide range of complex, fam command of a broad range o v evidence of analytical and criti ations. Apply effective organiza tt incomplete command of kn ce of some analytical and criti moderately effective organizati limited command of knowledge coherent and logical thinking, the versum the strong strong properties of the strong properties of the strong properties of the strong properties of the strong properties of the strong properties of the strong properties of the strong properties of the strong properties of the strong properties of the strong properties of the strong properties p	abilities and logical thinking, waliar and unfamiliar situations. knowledge and skills require cal abilities and logical thinkinitional and presentational skills owledge and skills required for all abilities and logical thinkin and presentational skills. and skills required for attainiful with limited analytical and cective organizational and presedge and skills required for attainiful thinking. Show very little of the stranger of the strang	skills required for attaith evidence of origina Apply highly effectived for attaining at least and ability to apply for attaining most of g, and ability to apply a some of the courseritical abilities. Show I entational skills.	aining all the course al thought, and abilit e organizational and it most of the course knowledge to familia the course learning y knowledge to mos e learning outcomes imited ability to appl	

Course Teaching	Activities	Details	Details		
& Learning Activities	Lectures			36	
	Tutorials			12	
	Reading / Self study			80	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignments	Including computational assignments	20	CLO 1,2,3,4,5	
	Examination	3-hour written exam	60	CLO 1,2,3,4,5	
	Test		20	CLO 1,2,3,4,5	
Required/recommended reading and online materials	Lecture notes provided by Control D. J. Griffiths: Introduction to	ourse Coordinator Electrodynamics, 3rd ed., (Prentice-H	all, 1999).		
Course Website	http://moodle.hku.hk				

PHYS3550	Statistic	al mechanics	& thermodynamics (6 credits)	Academic Y	'ear 2020		
Offering Department	Physics		·	Quota			
Course Co-ordinator	Dr S Z Zha	Dr S Z Zhang, Physics (shizhong@hku.hk)					
Teachers Involved	(Dr S Z Zhang,Physics)						
Course Objectives	This course covers statistical mechanics in the advanced undergraduate level with rigorous mathematica treatment. It is one of the core electives for physics major and an elective course for the theoretical physics theme. This is also an essential course for those who plan to pursue postgraduate studies in physics or related disciplines. Problem solving and analytical skills will be extensively used. They are supplemented by numerical skills occasionally. Upon completion, interested and able students may take PHYS7550 to study graduate lever statistical mechanics.						
Course Contents & Topics	constituen mechanics	This course includes the following topics: statistical description of macroscopic systems in terms of its microscopic constituents; canonical distribution and its applications in simple systems; classical and quantum statistical mechanics: Bose and Fermi distributions; Bose and Fermi gas; condensation; photon gas and Planck radiation law first order and continuous phase transition.					
Course Learning	On succes	ssful completion o	f this course, students should be able t	0:			
Outcomes	CLO 1 un	derstand the logi	cal structure of statistical mechanics				
			ann distribution and partition function ir				
			e and Fermi distributions and apply the				
		escribe the classited and the classited and the classited and the classited are classited as the classited and the classited and the classical and the classical are classical and the classical are classical and the classical are classical and the classical are classic	fication of phase transitions and unde on	rstand the use of mean fi	eld theory in secon		
Pre-requisites (and Co-requisites and Impermissible combinations)		•	HYS2260 or PHYS2261)				
Offer in 2020 - 2021	Y 2nd	sem Offer in 20	021 - 2022 : Y	Examination	n May		
Grade Descriptors (A+ to F)	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course						
	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most						
	familiar situations. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply						
	knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve						
			tion and presentational skills are minimally effect				
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	3	Details		No. of Hours		
& Learning Activities	Lectures						
	Tutorials						
		Self study			80		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	Including computational assignments	20	CLO 1,2,3,4		
	Examinat	ion	2-hour written exam	60	CLO 1,2,3,4		
	Test			20	CLO 1,2,3,4		
Required/recommended reading and online materials	Lecture notes provided by Course Coordinator Stephen J. Blundell and Katherine M. Blundell, Concepts in Thermal Physics, Oxford University Press, 2010 Herbert B. Callen, Thermodynamics and an Introduction to Thermostatistics, John Willey & Sons, Inc. (1985)						

PHYS3551	Introductory solid state physics (6 credits)	Academic Year	2020			
Offering Department	Physics	Quota				
Course Co-ordinator	Prof J Gao, Physics (jugao @hku.hk)					
Teachers Involved						
Course Objectives	To provides a broad introduction to modern theories of the behaviour and prop is designed as a self-contained course which at the same time will serve as a and projects in solid state physics.					

Course Contents & Topics	Crystal structures and symmetry. The formation of crystals. The reciprocal lattice and X-ray diffraction in crystals. Lattice vibrations and thermal properties. Free-electron theory of metals. Energy bands; metals, semiconductors,					
a ropics	and insulators. If time permits, special topics such as superconductor will be briefly mentioned.					
Course Learning			course, students should be		ou.	
Outcomes			or crystal structures and c			
				e underlying physical concepts		
				ns to discuss the physical prope	rties of materials	
				appropriate instruments in phys		
				ne prediction of underlying physi		
Pre-requisites (and Co-requisites and Impermissible combinations)		PHYS2260 and PHYS226	•	. , , ,		
Offer in 2020 - 2021	N Of	fer in 2021 - 2022 : N		Examinat	on	
Grade Descriptors (A+ to F)	A	learning outcomes. Show s to apply knowledge to a w	trong analytical and critical abilitide range of complex, familiar	extensive knowledge and skills required ties and logical thinking, with evidence of and unfamiliar situations. Apply highly echniques. Critical use of data and res	of original thought, and ability effective organizational and	
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.				
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective latiskills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.					
Course Type	Lecture v	vith laboratory componer	t course			
Course Teaching	Activitie	s	Details		No. of Hours	
& Learning Activities	Lectures	3			36	
	Laborato	ory			6	
	Tutorials	}			8	
	Reading	/ Self study			80	
Assessment Methods and Weighting	Methods	S	Details	Weighting in fina course grade (%		
	Assignm	ents		15	CLO 1,2,3,5	
	Examina		2-hour written exam	60	CLO 1,2,3	
	Laborato	ory reports		10	CLO 4,5	
	Test			15	CLO 1,2,3	
Required/recommended reading and online materials	C. Kittel:	Introduction to Solid Stat	e Physics (John Wiley, 19	986, 6th ed.)		

PHYS3650	Observationa	l astronomy (6 credits)	Academic Year	2020				
Offering Department	Physics		Quota					
Course Co-ordinator	Dr J J L Lim, Ph	Dr J J L Lim, Physics (jjlim@hku.hk)						
Teachers Involved	(Dr J J L Lim,Ph	ysics)						
Course Objectives	This course introduces tools of contemporary observational astronomy, with a focus on those used at optica wavelengths. The course concludes with an introduction to the basic physical aspects of stars and galaxies derived from astronomical observations. It is a core course for astronomy minor and an elective course for the astrophysics theme.							
Course Contents & Topics	of light, effects and magnitude	Topics include: properties and workings of optical telescopes and astronomical detectors (e.g., CCDs); properties of light, effects of Earth's atmosphere and interstellar medium on astronomical observations; astronomical imaging and magnitude system; astronomical photometry and spectroscopy; observations of stars and galaxies including blackbody radiation, color-magnitude system, emission and absorption spectrum, and astronomical redshifts.						
Course Learning	On successful completion of this course, students should be able to:							
Outcomes	CLO 1 describe and explain the workings of astronomical telescopes and detectors at optical wavelengths							
	CLO 2 describe how the inherent properties of light, the Earth's atmosphere, and the interstellar medium affect astronomical observations							
	CLO 3 explain how astronomical photometry and spectroscopy are conducted							
	CLO 4 perform computations to demonstrate competence on and understanding of the concepts learnt							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in PHYS2	:55 or PHYS2650						
Offer in 2020 - 2021	Y 1st sem	Offer in 2021 - 2022 : Y	Examination	Dec				
Grade Descriptors (A+ to F)	learn to ap	nstrate thorough mastery at an advanced level of extensive kno g outcomes. Show strong analytical and critical abilities and logic bly knowledge to a wide range of complex, familiar and unfamil tational skills.	cal thinking, with evidence of origina	al thought, and ability				
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.							
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.							

	D Fail	Show evidence of so knowledge to solve purpose Demonstrate little or	ourse learning outcomes. ow limited ability to apply learning outcomes. Lack oply knowledge to solve				
Course Type	Lecture-b	pased course	on and presentational skills are minimally of	desire of menegave.			
Course Teaching	Activitie	s	Details		No. of Hours		
& Learning Activities	Lectures		8 chapters	8 chapters			
	Tutorials		7 sessions	7 sessions			
	Reading / Self study			80			
Assessment Methods and Weighting	Methods	5	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm	ents		40	CLO 1,2,3,4		
	Examina	tion	2-hour written exam	60	CLO 1,2,3,4		
Required/recommended reading and online materials		To Measure the Sky by Frederick R. Chromey An Introduction to Modern Astrophysics by Bradley Carroll & Dale A. Ostlie					
Course Website	http://ww	w.physics.hku.hk/~	phys3650/				

PHYS3651	The phy	ysical universe (6 cr	edits)	Academic Yea	r 2020			
Offering Department	Physics		•	Quota				
Course Co-ordinator	Dr K M L	Dr K M Lee, Physics (kmlee@lily.physics.hku.hk)						
Teachers Involved	(Dr K M Lee,Physics)							
Course Objectives	To introduce basic physical principles of astronomy and build a foundation in modern astrophysics.							
Course Contents	Topics include: the sky and celestial coordinates, spherical geometry, optics and telescopes, basic celestia							
& Topics			diative transfer, and blackbody					
Course Learning			course, students should be ab					
Outcomes	CLO 1		ation between different celesti	•				
	CLO 2		of spectral lines and basic stru					
	CLO 3		body problem from first princi	ple				
	CLO 4	recall the radiative tran	•					
Pre-requisites (and Co-requisites and Impermissible combinations)		ss in PHYS1650 and (PHYS2250 or PHYS2265)						
Offer in 2020 - 2021		fer in 2021 - 2022 : N		Examination				
Grade Descriptors (A+ to F)	A	learning outcomes. Show s	trong analytical and critical abilities a	sive knowledge and skills required for a nd logical thinking, with evidence of origi unfamiliar situations. Apply highly effect	nal thought, and ability			
	В	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.							
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.							
Course Type	Lecture-b	pased course						
Course Teaching	Activitie	s	Details		No. of Hours			
& Learning Activities	Lectures			36				
	Tutorials			12				
	Reading	/ Self study			80			
Assessment Methods and Weighting	Methods	S	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignm	ents		12	CLO 1,2,3,4			
	Examina	ition	2-hour written exam	60	CLO 1,2,3,4			
	Presentation			13	CLO 2,4			
	Test 15				CLO 1,2,3,4			
Required/recommended reading and	Bradley \		stlie, An Introduction to Moder	n Astrophysics, 2nd ed. (Pearson	, ,			
online materials	Frank H. A. C. Phi	Shu, The Physical University of Star	erse: An Introduction to Astronos (John Wiley & Sons, 1999)	n Astrophysics (Wiley-Interscienc omy (University Science Books, 1				
Course Website		, Statisticai Pnysics, 2nd w.physics.hku.hk/~phys3	ed. (John Wiley & Sons, 1988	7				

PHYS3652	Principles of astronomy (6 credits)	Academic Year	2020
Offering Department	Physics	Quota	
Course Co-ordinator	Dr L X Dai, Physics (lixindai@hku.hk)		
Teachers Involved	(Dr L X Dai,Physics)		
Course Objectives	To introduce or review a number of basic physical principles, and explain he astronomy to gain knowledge of the Universe.	ow these principle	s are applied in
Course Contents	Topics include: special relativity, Doppler effect; interaction of light and relativity.	natter, spectral li	nes; single-dish

& Topics	telesco	pes and interferomet	ers; binary stars and stellar parar	meters, exoplanets; classification	of stellar spectra.
Course Learning	On succ	cessful completion of	f this course, students should be	able to:	
Outcomes	CLO 1	describe and explain	n the physical principles discusse	ed	
				erved properties of certain astron	
	CLO 3	apply their underst	anding of the physical principle	e discussed to explain or com	pute the observed
		properties of select a	astronomical objects		
Pre-requisites	Pass in	PHYS1650 and (PH	YS2250 or PHYS2265)		
and Co-requisites					
and Impermissible					
combinations)					
Offer in 2020 - 2021		Offer in 2021 - 2022 :		Examination	
Grade Descriptors (A+ to F)	A	analytical and critical	l abilities, clear logical thinking, evidence	equired for attaining all the course learning of original thought, and ability to apply k ective organizational and presentation skil	nowledge to a wide range
	B Demonstrate substantial command of the knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities, reasoned logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities, logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture	-based course	· ·		
Course Teaching	Activit	ies	Details		No. of Hours
& Learning Activities	Lecture	es			36
•	Tutoria	ls			12
	Readin	g / Self study			80
Assessment Methods	Method	ds	Details	Weighting in final	Assessment
and Weighting				course grade (%)	Methods to CLO Mapping
	Assigni	ments		35	CLO 1,2,3
	Examir	nation	2-hour written exam	50	CLO 1,2,3
	Test			15	CLO 2,3
Required/recommended reading and online materials		arroll & D. A. Ostlie:		physics (Addison-Wesley Publish	ing Company, 2007

PHYS3653	Astroph	ysics (6 credits)		Academic Year	2020		
Offering Department	Physics	,		Quota			
Course Co-ordinator	Dr L X Da	, Physics (lixindai@hk	u.hk)				
Teachers Involved	(Dr L X Da	(Dr L X Dai,Physics)					
Course Objectives	This course is a beginner course in astrophysics - we will introduce the most basic and direct connection between astronomy and physics, which will help you gain a better understanding of various astronomical objects and phenomena from first principles. This course will also aim to develop skills in approaching problems in astrophysics, which will set the stage for taking more advanced astrophysics courses and conducting scientific research. It is one of the core electives for astronomy minor and an elective course for the astrophysics theme. Upon completion, interested student may take its sequel PHYS4656 to further their studies in astrophysics.						
Course Contents & Topics	astronomy	; basics of radiative pr	dynamics, gravitation, binary socesses including blackbody radiagnitude calculations in astrophy	liation, emission and absorption			
Course Learning	On succes	sful completion of this	course, students should be able t	to:			
Outcomes	CLO 1 de	scribe the fundamenta	l physics underlying a wide range	e of astronomical phenomena			
	CLO 2 apply the physical formulae learnt through the course to study astrophysical problems and perform calculations						
		valan akilla ta aimplifik	analyze and solve problems in as	stronhysics			
Pre-requisites				ou opinyoloo			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Pl	HYS2250 or PHYS226	5 or PHYS2650	·			
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	Pass in Pl	HYS2250 or PHYS226:	5 or PHYS2650 2022 : Y	Examination	May		
(and Co-requisites and Impermissible	Pass in Pl	sem Offer in 2021 - Demonstrate thorough materning outcomes. Show to apply knowledge to a	5 or PHYS2650	Examination e knowledge and skills required for att logical thinking, with evidence of origin	taining all the course al thought, and ability		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in Pl	sem Offer in 2021 - Demonstrate thorough matering outcomes. Show to apply knowledge to a presentational skills. Demonstrate substantial of learning outcomes. Show the seminary of the seminary of the seminary of the seminary outcomes.	2022 : Y stery at an advanced level of extensive strong analytical and critical abilities and wide range of complex, familiar and unformmand of a broad range of knowledge evidence of analytical and critical abilities.	Examination e knowledge and skills required for att logical thinking, with evidence of origin familiar situations. Apply highly effective e and skills required for attaining at lead and logical thinking, and ability to apply	taining all the course al thought, and ability re organizational and st most of the course		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in Pl	sem Offer in 2021 - Demonstrate thorough ma learning outcomes. Show to apply knowledge to a presentational skills. Demonstrate substantial of learning outcomes. Show and some unfamiliar situat Demonstrate general but outcomes. Show evidence	5 or PHYS2650 2022 : Y stery at an advanced level of extensive strong analytical and critical abilities and wide range of complex, familiar and unformmand of a broad range of knowledge	Examination e knowledge and skills required for att logical thinking, with evidence of origin familiar situations. Apply highly effective e and skills required for attaining at lea- and logical thinking, and ability to apply resentational skills. id skills required for attaining most of and logical thinking, and ability to apply	taining all the course al thought, and ability re organizational and st most of the course knowledge to familiar the course learning		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 2nd A B	sem Offer in 2021 - Demonstrate thorough matering outcomes. Show to apply knowledge to a presentational skills. Demonstrate substantial of learning outcomes. Show and some unfamiliar situat Demonstrate general but outcomes. Show evidence familiar situations. Apply monomorphism Demonstrate partial but lingshow evidence of some ocknowledge to solve problem.	2022 : Y stery at an advanced level of extensive strong analytical and critical abilities and wide range of complex, familiar and unformmand of a broad range of knowledge evidence of analytical and critical abilities ons. Apply effective organizational and princomplete command of knowledge and critical abilities and command of knowledge and skills of some analytical and critical abilities and command of knowledge and skills of some analytical and critical abilities. Apply limited or barely effective organizational and president and logical thinking, but with limite ms. Apply limited or barely effective organ	Examination e knowledge and skills required for att logical thinking, with evidence of origin familiar situations. Apply highly effective e and skills required for attaining at lear and logical thinking, and ability to apply resentational skills. Id skills required for attaining most of and logical thinking, and ability to apply esentational skills. required for attaining some of the cours ed analytical and critical abilities. Show hizational and presentational skills.	laining all the course al thought, and ability re organizational and st most of the course knowledge to familiar the course learning by knowledge to most se learning outcomes. Ilmited ability to apply		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in Pl	sem Offer in 2021 - Demonstrate thorough ma learning outcomes. Show to apply knowledge to a presentational skills. Demonstrate substantial o learning outcomes. Show dearning outcomes. Show outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lir Show evidence of some oc knowledge to solve problet Demonstrate little or no ev of analytical and critical	2022 : Y stery at an advanced level of extensive strong analytical and critical abilities and wide range of complex, familiar and unformmand of a broad range of knowledge evidence of analytical and critical abilities ons. Apply effective organizational and princomplete command of knowledge and of some analytical and critical abilities and coderately effective organizational and pre nited command of knowledge and skills reherent and logical thinking, but with limite	Examination e knowledge and skills required for att logical thinking, with evidence of origin familiar situations. Apply highly effective and skills required for attaining at lear and logical thinking, and ability to apply resentational skills. It is skills required for attaining most of and logical thinking, and ability to apply esentational skills. required for attaining some of the cours ed analytical and critical abilities. Show nizational and presentational skills. Kills required for attaining the course lea Show very little or no ability to apply	taining all the course at thought, and ability are organizational and st most of the course knowledge to familiar the course learning by knowledge to most se learning outcomes. limited ability to apply arming outcomes. Lack		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Pass in Pl	sem Offer in 2021 - Demonstrate thorough ma learning outcomes. Show to apply knowledge to a presentational skills. Demonstrate substantial o learning outcomes. Show dearning outcomes. Show outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lir Show evidence of some oc knowledge to solve problet Demonstrate little or no ev of analytical and critical	2022 : Y stery at an advanced level of extensive strong analytical and critical abilities and wide range of complex, familiar and unformand of a broad range of knowledge evidence of analytical and critical abilities. ons. Apply effective organizational and princomplete command of knowledge and of some analytical and critical abilities adderately effective organizational and previted command of knowledge and skills represent and logical thinking, but with limitems. Apply limited or barely effective organizational and previous command of knowledge and skills represent and logical thinking, but with limitems. Apply limited or barely effective organizations of command of knowledge and skibilities, logical and coherent thinking. Secondary or provided thinking.	Examination e knowledge and skills required for att logical thinking, with evidence of origin familiar situations. Apply highly effective and skills required for attaining at lear and logical thinking, and ability to apply resentational skills. It is skills required for attaining most of and logical thinking, and ability to apply esentational skills. required for attaining some of the cours ed analytical and critical abilities. Show nizational and presentational skills. Kills required for attaining the course lea Show very little or no ability to apply	taining all the course at thought, and ability are organizational and st most of the course knowledge to familiar the course learning by knowledge to most se learning outcomes. limited ability to apply arming outcomes. Lack		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Pass in Pl	sem Offer in 2021 - Demonstrate thorough malearning outcomes. Show to apply knowledge to a presentational skills. Demonstrate substantial of learning outcomes. Show and some unfamiliar situations. Apply momenstrate general but outcomes. Show evidence familiar situations. Apply momenstrate partial but lir Show evidence of some or knowledge to solve problem Demonstrate little or no evidence of analytical and critical aproblems. Organization and ased course	2022 : Y stery at an advanced level of extensive strong analytical and critical abilities and wide range of complex, familiar and unformand of a broad range of knowledge evidence of analytical and critical abilities. ons. Apply effective organizational and princomplete command of knowledge and of some analytical and critical abilities adderately effective organizational and previted command of knowledge and skills represent and logical thinking, but with limitems. Apply limited or barely effective organizational and previous command of knowledge and skills represent and logical thinking, but with limitems. Apply limited or barely effective organizations of command of knowledge and skibilities, logical and coherent thinking. Secondary or provided thinking.	Examination e knowledge and skills required for att logical thinking, with evidence of origin familiar situations. Apply highly effective and skills required for attaining at lear and logical thinking, and ability to apply resentational skills. It is skills required for attaining most of and logical thinking, and ability to apply esentational skills. required for attaining some of the cours ed analytical and critical abilities. Show nizational and presentational skills. Kills required for attaining the course lea Show very little or no ability to apply	taining all the course at thought, and ability are organizational and st most of the course knowledge to familiar the course learning by knowledge to most se learning outcomes. limited ability to apply arming outcomes. Lack		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in Plant A A B C D Fail Lecture-ba	sem Offer in 2021 - Demonstrate thorough malearning outcomes. Show to apply knowledge to a presentational skills. Demonstrate substantial of learning outcomes. Show and some unfamiliar situations. Apply momenstrate general but outcomes. Show evidence familiar situations. Apply momenstrate partial but lir Show evidence of some or knowledge to solve problem Demonstrate little or no evidence of analytical and critical aproblems. Organization and ased course	2022 : Y stery at an advanced level of extensive strong analytical and critical abilities and wide range of complex, familiar and unformmand of a broad range of knowledge evidence of analytical and critical abilities ons. Apply effective organizational and princomplete command of knowledge and of some analytical and critical abilities and command of knowledge and skills or otherent and logical thinking, but with limite ms. Apply limited or barely effective organidence of command of knowledge and skillities, logical and coherent thinking. Step in the property of the pr	Examination e knowledge and skills required for att logical thinking, with evidence of origin familiar situations. Apply highly effective and skills required for attaining at lear and logical thinking, and ability to apply resentational skills. It is skills required for attaining most of and logical thinking, and ability to apply esentational skills. required for attaining some of the cours ed analytical and critical abilities. Show nizational and presentational skills. Kills required for attaining the course lea Show very little or no ability to apply	taining all the course al thought, and ability re organizational and st most of the course knowledge to familiar the course learning ly knowledge to most se learning outcomes. Ilimited ability to apply ming outcomes. Lack knowledge to solve		

	Reading / Self study			80
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		20	CLO 1,2,3
	Examination	2-hour written exam	50	CLO 1,2,3
	Test		30	CLO 1,2,3
Required/recommended reading and online materials	An Introduction to Modern Astroph	nysics, by Bradley Carroll & Dale A.	Ostlie	
Course Website	http://www.physics.hku.hk/~phys3	653/		

PHYS3660	Astrono	my laboratory (6 c	redits)	Academic Yea	r 2020	
Offering Department	Physics		·	Quota	9	
Course Co-ordinator	Dr S C Y I	Ng, Physics (ncy@astr	ro.physics.hku.hk)			
Teachers Involved		Ng,Physics)				
Course Objectives	This course trains students with basics of extracting scientific information with astronomical observations. The focus is on practical experience in operating telescopes, data acquisition and reduction, and interpretation of the results rather than verification of known astronomical theories. It is one of the core electives for astronomy minor and an elective course for the astrophysics and experimental physics themes. Upon completion, interested students may apply the techniques learnt here in observational astronomy related capstone courses.					
Course Contents & Topics	This course will cover the following topics: basics working principles of optical telescopes and CCDs; setting up and hands-on operations of small optical telescopes; error analysis and basic statistics related to the astronomy laboratories; introduction to the magnitude system and celestial coordinates, the color magnitude diagram; observations and data reduction techniques in multi-wavelength astronomy; introduction to data analysis software packages.					
Course Learning	On succes	ssful completion of this	course, students should be able to	:		
Outcomes		quire astronomy obse				
			verify the physical principle(s) in as			
	CLO 4 us	• • •	required to interpret and analyze re and verbal communication skills			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in (PHYS2265 or PHYS2650); and Pass in PHYS3650, or already enrolled in this course.					
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - :	2022 : Y	Examination	Dec	
Grade Descriptors (A+ to F)	A	learning outcomes. Show to apply knowledge to a	astery at an advanced level of extensive le strong analytical and critical abilities and lo wide range of complex, familiar and unfar y highly effective lab skills and techniques.	gical thinking, with evidence of origi niliar situations. Apply highly effect	nal thought, and ability ive organizational and	
	В					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.				
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.					
Course Type	Lecture wi	ith laboratory compone	ent course			
Course Teaching	Activities	•	Details		No. of Hours	
& Learning Activities	Lectures		Working principle of telescopes, error analysis, data analysis skills		8	
	Laborator	•	Conduct astronomy observational and data analysis laboratories		28	
	Project w		Presentation and preparation		20	
		Self study			64	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Laborator	•	6-8 Laboratory reports	70	CLO 1,2,3,4	
	Presentat	tion	1 oral presentation	15	CLO 1,2,3,4	
	Test		1 in-class test	15	CLO 1,3,4	
Required/recommended reading and	L. M. Gold		ments in Physics for Modern Astron			
online materials			aboratory: Advanced Astronomy Pr	ojects for Amateurs, Praxis (2	2007)	
Course Website	http://moodle.hku.hk					

PHYS3750	Laser and spectroscopy (6 credits)	Academic Year	2020
Offering Department	Physics	Quota	
Course Co-ordinator	Dr T T Luu, Physics (ttluu@hku.hk)		
Teachers Involved	(Dr T T Luu,Physics)		
Course Objectives	The course covers major types of lasers and laser spectroscopy in the advan	nced undergradua	ite level. It is an

				so an essential course for those and its applications such as phy		
	engineeri		ireas Gosely related to lasel	and its applications such as phy	sics, Giennsuy, and	
Course Contents & Topics	Introducti technique spectroso	Introduction to lasers and laser spectroscopy techniques. Fundamentals of optical processes and spectroscopic techniques. Lasers as spectroscopic light sources. Components of spectroscopic instruments. Nonlinear spectroscopy. Raman spectroscopy. Laser spectroscopy in molecular beams. Time-resolved spectroscopy. Coherent spectroscopy. Laser spectroscopy of coherent processes. New developments in laser spectroscopy.				
Course Learning			course, students should be ab	•	,	
Outcomes	CLO 1 re	state the properties of fu	undamental optical processes	S		
	CLO 2 de	escribe fundamental ope	ration principle of modern las	ers		
	CLO 3 id	entify main components	of modern optical spectrosco	pic instruments		
	CLO 4 co	omprehend/formulate a b	proad overview of spectrosco	pic techniques		
		mploy laser photolumine amples	escence setup to measure lo	w-temperature photoluminescer	nce spectra of solid	
	CLO 6 in	terpret the experimental	data and compare with the p	rediction of underlying physical p	orinciple	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in P	HYS2255 and PHYS226	55			
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20	022 : Y	Examination	Dec	
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.					
	В	9				
	С					
	D					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.					
Course Type	Lecture w	rith laboratory componer	nt course			
Course Teaching	Activitie	•	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Laborato	ry			10	
	Tutorials				8	
	Reading	/ Self study			80	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignm	ents		15	CLO 1,2,3,4,6	
	Examination		2-hour exam	50	CLO 1,2,3,4	
	Laboratory reports			15	CLO 5,6	
	Test	, ,		20	CLO 1,2,3,4	
Required/recommended reading and			e Coordinator ctroscopy V1, 2, 5th Edition,	Springer, (2014)		
online materials	3 13		., , ,	. 5 / ()		
Course Website	http://mod	odle.hku.hk				

PHYS3751	Physic	cs of nanomaterials (6 credits)	cademic Year	2020			
Offering Department	Physics	Q	luota				
Course Co-ordinator	TBC, P	nysics ()					
Teachers Involved	(TBC,P	nysics)					
Course Objectives	concep	This course is designed to let senior undergraduate students and fresh postgraduate students know fundamental concepts and physical properties of nanomaterials including two-dimensional quantum wells, one-dimensional quantum wires and zero-dimensional quantum dots.					
Course Contents & Topics	nanoma Physica nanocry	Introduction to nanomaterials and quantum size effect. Dimensionalities and density of states of various nanomaterials. Optical and transport properties of quantum wells, superlattices and two-dimensional electron gas Physical properties of carbon nanotubes and semiconductor nanowires. Physical properties of quantum dots and nanocrystals. Fundamental principles of scanning tunneling microscopy and advanced thin-film growth techniques such as molecular beam epitaxy and metalorganic chemical vapor deposition.					
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 recall basic concepts and knowledge of dimensionality, density of states, quantum size effect						
	CLO 2 identify and compare optical and transport properties of quantum wells, superlattices and two-dimensional electron gas						
	CLO 3 recognise the fundamental principles of scanning tunneling microscopy and advanced thin-film growth techniques such as molecular beam epitaxy and metalorganic chemical vapor deposition						
	CLO 4 describe the basic physics of carbon nanotubes and semiconductor nanowires						
	CLO 5 explain physical properties of zero-dimensional quantum dots and nanocrystals						
Pre-requisites (and Co-requisites and Impermissible combinations)		PHYS3351; and PHYS3551, or already enrolled in this course.					

Offer in 2020 - 2021	N O	offer in 2021 - 2022 : N		Examination		
Grade Descriptors (A+ to F)	A	learning outcomes. Show st	rong analytical and critical at	f extensive knowledge and skills required for illities and logical thinking, with evidence of ori ar and unfamiliar situations. Apply highly effe	ginal thought, and ability	
	В	Show evidence of analytical		nd skills required for attaining most of the cou ed logical thinking, and ability to apply knowled esentation skills.		
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective observation skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.				
	D					
	Fail					
Course Type	Lecture-	based course				
Course Teaching & Learning Activities	Activiti	es	Details		No. of Hours	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
Required/recommended reading and online materials	TBC					

PHYS3760	Physics	s laboratory (6 cre	edits)	Academic Ye	ar 2020		
Offering Department	Physics	• ,		Quota	16		
Course Co-ordinator	Dr J H C	Dr J H C Lee, Physics (jleehc @hku.hk)					
Teachers Involved	,	C Lee,Physics) .uu,Physics)					
Course Objectives	physics acquisition electives	This course trains students with experimental knowledge and skills, as well as the understanding on how to prove physics principles with measurements. The focus is on advanced lab skills and techniques, including data acquisition, and data analysis by computers rather than verification of known physical theories. It is one of the core electives for physics major and a required course for the experimental physics theme. Upon completion, interested students may apply the techniques learnt here in experiment-oriented capstone courses.					
Course Contents & Topics	This coulevel ph thermody the way small gro	This course equips students with the necessary experimental techniques commonly used in advanced university level physics experiments drawn from classical mechanics, electromagnetism, statistical mechanics and thermodynamics, and quantum mechanics. After introducing the basics in a few lectures, students have to work all the way from experimental setup, data acquisition to data analysis, possibly with the aid of a computer, either in a small group or an individual. In addition to eight labs, they also have to conduct a small experimental project and present their result orally. Contents of the experiments and small projects may vary from year to year.					
Course Learning	On succe	essful completion of th	nis course, students should be a	able to:			
Outcomes	CLO 2 d	CLO 1 acquire advanced physics experimental techniques CLO 2 design and conduct experiments to verify the physics principle(s) commonly used in advanced level physics courses					
	CLO 4 n			alyze results, and draw conclusion tion skills through written laborate			
Pre-requisites and Co-requisites and Impermissible combinations)		Pass in any two of the following courses: PHYS3350, PHYS3351, PHYS3450, PHYS3550					
Offer in 2020 - 2021	Y 2n	nd sem Offer in 2021		Examination	May		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lac of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective la skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.						
Course Type		with laboratory compo	nent course				
Course Teaching	Activitie	es	Details		No. of Hours		
Learning Activities	Lectures	3	analysis, Writing skills	Working principle of equipment, Experimental Skills, Data analysis, Writing skills			
	Laborato	ory	8 standard labs and 1 proj	ect	28		
	Project v	work	Presentation and preparat		20		
	Reading	/ Self study			64		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		

	Laboratory reports	8 lab reports	70	CLO 1,2,3,4		
	Presentation	1 oral presentation	15	CLO 2,3		
	Project report	1 full project report	15	CLO 1,2,3,4		
Required/recommended	Lab manuals provided by Course	Coordinator				
reading and	L. Lyons, A Practical Guide to Data Analysis for Physical Science Students, CUP (1991)					
online materials	P. Horowitz and W. Hill, The Art of Electronics, CUP (1989)					
	Python tutorial at https://www.python.org/about/gettingstarted/					

PHYS3850	Physica	I Optics (6 credits)		Academic Yea	r 2020		
Offering Department	Physics	. , ,		Quota			
Course Co-ordinator	Dr D K Ki	, Physics (dkki@hku.hk)					
Teachers Involved	(Dr D K K	(Dr D K Ki,Physics)					
Course Objectives	This course covers the development of modern physical optics, with particular attention to the physical properties and applications of light in the advanced undergraduate level. It is an elective course for the experimental physics theme.						
Course Contents & Topics	of light wa	Wave theory of electromagnetic radiations and light; Review of geometric optics; the propagation and superposition of light waves; interference, diffraction and coherence of light; Fourier optics; Some topics of modern optics					
Course Learning		•	course, students should be able to:				
Outcomes	in	terference and diffraction	fundamental properties including n of light waves by using the theory	y of waves			
	S	uch as refractive index	s to design optical arrangements		rties of materials,		
			design anti-reflection and reflection	on-enhancement films			
Pre-requisites (and Co-requisites and Impermissible combinations)		HYS2250 and PHYS225					
Offer in 2020 - 2021	Y 2n	d sem Offer in 2021 - 2		Examination	May		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.						
	B Demonstrate substantial command of the knowledge and skills required for attaining most of the course learning outcomes. Show evidence of analytical and critical abilities, reasoned logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective observation skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.						
	D						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.						
Course Type	Lecture w	vith laboratory componen	t course				
Course Teaching	Activitie	S	Details		No. of Hours		
& Learning Activities	Lectures		12 chapters		36		
	Laborato	ry	Completing the relevant labor submitting reports	ratory experiment and	6		
	Tutorials		Tutorials about the key points and question solving skills		8		
	Reading	/ Self study	Reading and reviewing lecture notes and developing problem-solving skills		80		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		4 assignments	15	CLO 1,2,3		
	Examination		2-hour written exam	50	CLO 1,2,3		
	Laboratory reports		Two experiments	15	CLO 1		
	Test		Mid-term test	20	CLO 1,2,3		
Required/recommended reading and online materials		lotes prepared by Course Optics (Addison-Wesley					
Course Website	http://mod	odle.hku.hk					

PHYS3851	Atomic and nuclear physics (6 credits)	Academic Year	2020		
Offering Department	Physics	Quota			
Course Co-ordinator	Dr J H C Lee, Physics (jleehc@hku.hk)				
Teachers Involved	(Dr J H C Lee, Physics)				
Course Objectives	This course covers the fundamentals of atomic physics and nuclear physics are and atomic and nuclear science in the advanced undergraduate level. Experie such as detection methods and principles of experiments with hand-on experie experimental physics theme. This is also an essential course for those who pla work in atomic and nuclear physics and related disciplines.	mental topics will a nce. It is an electi	also be included, ve course for the		
Course Contents & Topics	Properties of atoms and nuclei; nuclear composition; liquid drop model; shell m gamma decay; nuclear reactions; radiation detectors; nuclear astrophysics; fr atomic and nuclear science.				
Course Learning	On successful completion of this course, students should be able to:				

CI CI CI	LO 3 m LO 4 d LO 5 a ass in PH	nake general order escribe nuclear de pply basic experin	derations of quantum mechanics of magnitude in estimation of pleasy processes and nuclear reactinental skill for radiation detection in PHYS3351, or already enrolled	nysical effects in at ions in nucleosynth	oms and nuclei				
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors A	LO 4 d LO 5 a ass in PH	escribe nuclear de pply basic experin	ecay processes and nuclear reacti nental skill for radiation detection	ions in nucleosynth					
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors A	LO 5 a ass in PH	pply basic experin	nental skill for radiation detection	, ,	nesis				
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors A	ss in PH			ed in this course.					
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 N Grade Descriptors A		IYS2265; and Pas	s in PHYS3351, or already enrolle	ed in this course.					
Grade Descriptors A	Offe			Pass in PHYS2265; and Pass in PHYS3351, or already enrolled in this course.					
•		r in 2021 - 2022 :	Υ		Examination				
	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.								
В		learning outcomes. SI and some unfamiliar	tial command of a broad range of knowle now evidence of analytical and critical abil situations. Apply effective organizational a results to draw appropriate conclusions.	ities and logical thinking	g, and ability to apply	knowledge to familiar			
С									
D	Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.								
Fa	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.								
Course Type Lee	cture wit	h laboratory comp	onent course						
	ctivities		Details	Details					
& Learning Activities Le	ectures					36			
La	Laboratory					9			
Tu	Tutorials					8			
Re	Reading / Self study					80			
Assessment Methods and Weighting	ethods		Details	_	ing in final grade (%)	Assessment Methods to CLO Mapping			
As	ssignmer	nts			20	CLO 1,2,3,4			
E>	xaminatio	on	2-hour written exam		40	CLO 1,2,3,4			
La	aboratory	/ reports			20	CLO 1,2,3,5			
Τe	Test				20	CLO 1,2,3,4			
reading and Riconline materials B.	ecture notes from the Course Coordinator chard A. Dunlap: An Introduction to The Physics of Nuclei and Particles (Brooks/Cole, 2003) H. Bransden and C. J. Joachain: Physics of Atoms and Molecules (Pearson, 2nd, 2003) A. Littlefield & N. Thorley: Atomic and Nuclear Physics (Van Nostrand Reinhold Co. Ltd, 3rd, 1979) Krane: Introductory nuclear physics (John Wiley & Sons, 1988)								
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PHYS3999	Directed studies in physics (6 credits)	Academic Year	2020						
Offering Department	Physics Quota								
Course Co-ordinator	Dr F C C Ling, Physics (ccling@hku.hk)								
Teachers Involved	(Various teachers in the department,Physics)								
Course Objectives	This capstone course is offered to students majoring in physics, physics (intensive), math/physics or astronomy. I should be taken normally in their final year of study. Students investigate a small problem, either theoretical experimental or numerical, under the supervision of an academic staff using the subject materials they have learn in all years of their major studies. The available projects range from small scale research, critical literature review and comment, and to development of university-level physics teaching tools. Passing a pre-approved directed studies is recognized as having completed an elective in one of the four themes.								
Course Contents & Topics	contents and the nature of their projects in the coming academic year. prospective supervisor and the course coordinator to take this course. Students will receive training in research literature reading and reviewmember. For theoretical project, students may need to fill in mathematic and the critically analyze the research methods used in the field. For it	Students interested in taking this course should contact their prospective supervisors in May to determine to contents and the nature of their projects in the coming academic year. They must get the approval from both prospective supervisor and the course coordinator to take this course. Students will receive training in research literature reading and reviewing, under the supervision of a st member. For theoretical project, students may need to fill in mathematical gaps of some sophisticated derivation and the critically analyze the research methods used in the field. For numerical projects, students need to computers to reproduce existing numerical or simulation results. For experimental projects, students have							
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 review the knowledge of a physics or astronomy problem in dep research journals based on what they have learnt in their majors CLO 2 criticize existing approaches for solving the selected physics or as CLO 3 describe and explain connections between the physical principles	stronomy problem	ew of books and						
	CLO 4 (for theoretical or computational projects) identify the key issues of the problem and solve them independently either by analytical or numerical means, and compare the results with predictions or existing solutions CLO 5 (for experimental projects) propose and execute physics experiments or astronomical observations, analyze results and sources of errors of the experiment or observation in comparison with predictions CLO 6 (for projects involving team work) collaborate and communicate effectively in the team, which may								
Pre-requisites	comprise of people of different culture, gender and nationality Pass in at least 24 credits of advanced level (3XXX level or above) discip	linary core/elective cours	ses of the Physics						

(and Co-requisites and Impermissible	Major, Physics (Intensive) Major, Mathematics/Physics Major or Astronomy Major curriculum. This capstone course is for Astronomy, Mathematics/Physics, Physics, and Physics (Intensive) Majors students						
combinations)	only. The earliest that a student is allowed to take this capstone course is their year 3 study.						
Offer in 2020 - 2021							
Grade Descriptors (A+ to F)	A	Demonstrate thorough grasp of the subject. Show evidence of strong logical and independent thinking. Insightful use and critical analysis/evaluation of information drawn from a full range of high quality sources and to quote/reference aptiy. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills. Work of A+ should show considerable additional work beyond that is required in wider areas relevant to the topic.					
	В	information from s	ources, show ptly. Correct	of the subject. Show evidence of ing ability to make meaningful confuse of data of results to draw a	nparisons between different secon	dary interpretations and to	
	C Demonstrate general but incomplete grasp of the subject. Show some evidence of logical and independent thinking. Use of relevant information from sources, showing ability to make comparisons between different interpretations and to quote/reference aptly. Mostly correct but some erroneous use of data and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.						
	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Show limited evidence of logical and independent thinking. Demonstrate use and reference of several sources, but mainly through summary rather than analysis and comparison. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.						
	Fail	logical and indepe	ndent thinkin	or no grasp of the knowledge and g. Limited use of secondary sourc propriate conclusions. Organization	ces and no critical comparison of	them. Misuse of data and	
Course Type	Project-ba	ased course		· · · · · · · · · · · · · · · · · · ·		•	
Course Teaching	Activities		De	etails	No. of Hours		
& Learning Activities	Meeting with supervisor				36		
	Reading / Self study				84		
Assessment Methods and Weighting	Methods		D	etails	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Oral presentation			cluding supervisor's omments (10%)	30	CLO 1,3,4,5	
	Research	report		<u> </u>	70	CLO 1,2,3,4,5,6	
Required/recommended reading and online materials	To be provided by individual project supervisor						

PHYS4150	Compu	tational physics (6 credits)	Academic Year	2020					
Offering Department	Physics	Physics Quota							
Course Co-ordinator	Prof J Wa	Prof J Wang, Physics (jianwang@hku.hk)							
Teachers Involved	(Prof J W	(Prof J Wang, Physics)							
Course Objectives	problems approach computat	The aim of the course is show how the power of computers enables to computational approach to solving physics problems to be adopted, which is distinct from, and complimentary to, traditional experimental and theoretical approaches. The material covered will be found useful in any project or problem solving work that contains a strong computational or data analysis element. The course is designed such that a significant fraction of the student's time is spent actually programming specific physical problems rather than learning abstract techniques.							
Course Contents & Topics	and diffe mechanic Schrodin Poisson's	The course will cover the following problems: Introductory computational physics and computer algebra, integration and differentiation, interpolation and extrapolation, ordinary differential equation such as those of classical mechanics, partial differential equations (such as the Maxwell's equation, the diffusion equation, and the Schrodinger equation), matrix methods (such as systems of equations and eigenvalue problems applied to Poisson's equation and electronic structure calculations), Monte Carlo (Metropolis algorithm) and other simulation methods (such as molecular dynamics), and several physics projects.							
Course Learning	On succe	essful completion of this course, students should be	able to:						
Outcomes	CLO 1 d	emonstrate knowledge in essential methods and tec	hniques for numerical computation in	n physics					
	CLO 2 apply Monte Carlo method and other simulation methods to solve deterministic as well as probabilistic physical problems								
	CLO 3 employ appropriate numerical method to interpolate and extrapolate data collected from physics experiments								
	CLO 4 use appropriate numerical method to solve the differential equations governing the dynamics of physical systems								
Pre-requisites and Co-requisites and Impermissible combinations)		MATH3301 or MATH3401 or MATH3403 or MATH34 ony three of the following courses: PHYS3350, PHYS		nd					
Offer in 2020 - 2021	N Of	fer in 2021 - 2022 : Y	Examination						
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advanced level of ext learning outcomes. Show strong analytical and critical abilitie to apply knowledge to a wide range of complex, familiar ar presentational skills. Apply highly effective lab skills and tec insightful conclusions.	s and logical thinking, with evidence of origin nd unfamiliar situations. Apply highly effectiv	al thought, and abilit re organizational an					
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familial and some unfamiliar situations. Apply effective organizational and presentational skills. Apply effective lab skills and techniques Correct use of data of results to draw appropriate conclusions.							
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.								
	D	Demonstrate partial but limited command of knowledge and show evidence of some coherent and logical thinking, but will knowledge to solve problems. Apply limited or barely effective lab skills and techniques. Limited ability to use data and result	skills required for attaining some of the cours limited analytical and critical abilities. Show e organizational and presentational skills. Al s to draw appropriate conclusions.	limited ability to app oply partially effectiv					
	Fail	lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Pail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lac of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. Apply minimally effective or ineffective lal skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.							

Course Type	Lecture with laboratory component course					
Course Teaching	Activities	No. of Hours				
& Learning Activities	Lectures Laboratory					
						Tutorials
	Reading / Self study			80		
Assessment Methods and Weighting	Methods	Details	Details Weighting in final course grade (%)			
	Assignments		20	CLO 1,2,3,4		
	Examination	2-hour written exam	40	CLO 1,3,4		
	Presentation		15	CLO 1		
	Project report		25	CLO 1,2,3,4		
Required/recommended reading and online materials	Samuel S.M. Wong: Compu	Course Coordinator utational Methods in Physics and Eng nishi: Computational physics (Pearso				

PHYS4151	Data an	alysis and mod	deling in physics (6 credits)	Academic Ye	ear 2020		
Offering Department	Physics			Quota			
Course Co-ordinator		Prof H F Chau, Physics (hfchau@hku.hk)					
Teachers Involved		(Prof H F Chau,Physics)					
Course Objectives	special er basic prin for studer	This course covers general modeling and data analysis techniques used in physics and related subjects with special emphasis on their uses in complex systems, nonlinear systems and adaptive systems. The focus is on the basic principles and concepts rather than the use of computer packages. This course provides a solid foundation for students who intended to do computational physics and complex systems research. It also prepares students to work in related industries.					
Course Contents & Topics	basic hyp difference complex a data anal physical r be drawn	Topics include basic data analysis techniques, linear and non-linear fittings, determining the goodness of the fit, basic hypothesis testing techniques, modeling physical and related systems via differential (ordinary and/or partial), difference equations as well as discrete models such as cellular automata, introduction to complex systems, complex adaptive systems and nonlinear dynamics, the use of computer package such as Matlab in modeling and data analysis. The emphasis is on the basic principles and concepts rather than a particular software package or physical model. Depending on the mutual interests of the coordinators and the students, illustrative examples will be drawn from conventional fields such as classical mechanics, electromagnetism and quantum mechanics as well as more recent fields like biophysics, econophysics and sociophysics.					
Course Learning	On succe	ssful completion of	of this course, students should be able t	:0:			
Outcomes	CLO 1 de	escribe and explai	n state-of-the-art modeling methods us	ed in physics			
	pl	hysical world	ng techniques, together with logical a problems with the aid of computer pack		to situations of the		
		, ,	operimental data from physics experime	<u> </u>			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in (N	MATH3301 or MA	TH3401 or MATH3403 or MATH3405 owing courses: PHYS3350, PHYS3351,	r PHYS2160 or PHYS3150);	; and		
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2	021 - 2022 : Y	Examination	May		
Grade Descriptors (A+ to F)	В	Show evidence of analytical and critical abilities, reasoned logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations using effective organizational and presentation skills. Apply effective computer modeling skills and techniques. Correct use of data of results to draw appropriate conclusions.					
	D Fail	familiar situations. modeling skills and Demonstrate partial Show evidence of s knowledge to solve computer modeling Demonstrate little o of analytical and c problems. Organiza	vidence of some analytical and critical abilities and Apply moderately effective organizational and techniques. Mostly correct but some erroneous upon the limited command of knowledge and skills rome coherent and logical thinking, but with limite problems. Apply limited or barely effective organishils and techniques. Limited ability to use data rone evidence of command of knowledge and skritical abilities, logical and coherent thinking. Station and presentational skills are minimally effective many control of data and results and techniques. Misuse of data and results	presentational skills. Apply moder use of data and results to draw apprequired for attaining some of the code analytical and critical abilities. Shanizational and presentational skills and results to draw appropriate con ills required for attaining the course Show very little or no ability to apactive or ineffective. Apply minimal	ately effective computer opriate conclusions. ourse learning outcomes to apply a state of the conclusions. Apply partially effective clusions. learning outcomes. Lact the conclusions learning outcomes of the couply provided the conclusions the conclus		
Course Type	Lecture w	ith laboratory com	ponent course	• • • • • • • • • • • • • • • • • • • •			
Course Teaching	Activitie	•	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Laborato	ry					
	Tutorials				8		
		/ Self study			80		
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents		10	CLO 1,2,3,4		
	Examina		2-hour written exam	50	CLO 1,2,4		
	Presenta			20	CLO 1,4		
	Project re	eport		20	CLO 1,2,3,4		
Required/recommended reading and online materials	J. R. Tayl B. Hahn a	or: An Introduction and D. Valentine: I	Course Coordinator n to Error Analysis (Univ. Sci. Books, 2 Essential Matlab for Engineers and Sci for Beginners (World Sci., 1998)		ed., 2013)		

N. Boccara: Modeling Complex Systems (Springer, 2nd ed., 2012)
A.-L. Barabasi and H. E. Stanley: Fractal Concepts in Surface Growth (CUP, 1995)

PHYS4350	Advanced classical mechanics (6 credits) Academic Ye				ar 2020			
Offering Department	Physics							
Course Co-ordinator	Prof S Q	Prof S Q Shen, Physics (sshen@hku.hk)						
Teachers Involved	(Prof S Q	(Prof S Q Shen, Physics)						
Course Objectives	mathema	Build on the advanced undergraduate level course PHYS3350, this course further discusses concepts and mathematical techniques in classical mechanics through special topics and applications. It serves as an elective course to better prepare students for their postgraduate studies in physics or other related disciplines.						
Course Contents & Topics	Topics include: Hamiltonian principles, Lagrangian formulation of dynamics, nonlinear problems, many-body systems, variational principle, generalized coordinates, simple application of Lagrangian equation.							
Course Learning	On succe	essful completion of the	nis course, students should be a	able to:				
Outcomes	CLO 1 e	xplain the difference	between Newtonian mechanics	and analytical mechanics				
			problems using Lagrangian form					
			n between classical mechanics a rinciple to real physical situation	and quantum mechanics from Hanns	niltonian formalism			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in P	ass in PHYS3350						
Offer in 2020 - 2021	N Of	fer in 2021 - 2022 : N		Examination				
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.							
	Demonstrate substantial command of the knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.							
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.							
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.							
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.							
Course Type	Lecture-b	pased course						
Course Teaching	Activitie	s	Details	Details				
& Learning Activities	Lectures				36			
	Tutorials				12			
	Reading	/ Self study						
Assessment Methods and Weighting	Methods		Details	Weighting in final	Assessment			
				course grade (%)	Methods to CLO Mapping			
	Assignm	ents		course grade (%)	Methods			
	Assignm Examina		3-hour written exam		Methods to CLO Mapping			
			3-hour written exam	20	Methods to CLO Mapping CLO 1,2,3,4			
	Examina Test Lecture n	ition notes provided by Cou		20 60 20	Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4			

PHYS4351	Advance	d quantum mechanics (6 credits)	Academic Year	2020				
Offering Department	Physics	rsics Quota						
Course Co-ordinator	Dr Y Wang	Dr Y Wang, Physics (yongwang@hku.hk)						
Teachers Involved	(Dr Y Wang, Physics)							
Course Objectives	Build on the advanced undergraduate level course PHYS3351, this course further discusses concepts and mathematical techniques in quantum mechanics through special topics and applications. It serves as an elective course to better prepare students for their postgraduate studies in physics or other related disciplines.							
Course Contents & Topics	Identical particles. Pauli exclusion principle. Fermion and bosons. WKB approximation. Time-independent, non-degenerate and degenerate perturbation theory. Time dependent perturbation theory. Scattering, cross section, partial waves and Born approximation. Variational method.							
Course Learning	On successful completion of this course, students should be able to:							
Outcomes	CLO 1 review the perturbation theory and some other approximation methods on various quantum systems							
	CLO 2 apply physics principles to describe the physical properties of various quantum systems							
	CLO 3 demonstrate knowledge and discuss the underlying physical concepts associated with the selected quantum systems							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Ph	Pass in PHYS3351						
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2022 : Y	Examination	May				
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.							
	В	Demonstrate substantial command of a broad range of knowledge and sk learning outcomes. Show evidence of analytical and critical abilities and logi and some unfamiliar situations. Apply effective organizational and presentat	cal thinking, and ability to apply					
	and some unfamiliar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning							

		outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to ap familiar situations. Apply moderately effective organizational and presentational skills.						
	D	Show evidence of some col	ate partial but limited command of knowledge and skills required for attaining some of the course learn lence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	of analytical and critical al	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outco of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledg problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture-ba	ased course						
Course Teaching	Activities		Details	No. of Hours				
& Learning Activities	Lectures			36				
	Tutorials			12				
	Reading / Self study				80			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments			20	CLO 1,2,3			
	Examinat	ion	3-hour written exam	60	CLO 1,2,3			
	Test			20	CLO 1,2,3			
Required/recommended reading and online materials		ecture notes provided by Course Coordinator J. Griffiths: Introduction to Quantum Mechanics (Pearson Prentice Hall, 2004, 2nd edition).						
Course Website	http://wwv	v.physics.hku.hk/~phys4	351/					

PHYS4450	Advance	ed electromagnetis	m (6 credits)	Academic Year	2020		
Offering Department	Physics		<u> </u>	Quota			
Course Co-ordinator	Prof X D C	Prof X D Cui, Physics (xdcui@hku.hk)					
Teachers Involved	(Prof X D	Cui,Physics)					
Course Objectives	Build on the advanced undergraduate level course PHYS3450, this course further discusses concepts and mathematical techniques in electromagnetism through special topics and applications. It serves as an elective course to better prepare students for their postgraduate studies in physics or other related disciplines.						
Course Contents	Topics inc	lude Maxwell's Equati	ons, Poynting theorem, wave	e equations, reflection and transn	nission of waves,		
& Topics				e radiation, special theory of relativ	ity.		
Course Learning		· · · · · · · · · · · · · · · · · · ·	course, students should be ab				
Outcomes			undamental physics in classic	•			
				ctrostatic and magnetic phenomen	a		
	CLO 3 e	valuate how special rela	ativity is incorporated in the st	udy of electromagnetism			
	CLO 4 fc	ormulate and solve prob	olems in electromagnetism usi	ing appropriate mathematical techr	niques		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Ph	Pass in PHYS3450					
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2	022 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-ba	ased course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading /	Self study			80		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	nts		10	CLO 1,2,3,4		
	Examinati		3-hour written exam	60	CLO 1,2,3,4		
	Test			30	CLO 1,2,3,4		
Required/recommended reading and online materials			e Coordinator ctrodynamics, 3rd ed., (Prentic	ce-Hall, 1999).	,		

PHYS4550	Advanced statistical mechanics (6 credits)	Academic Year	2020
Offering Department	Physics	Quota	
Course Co-ordinator	Dr Y J Tu, Physics (yanjuntu@hku.hk)		
Teachers Involved	(Dr Y J Tu,Physics)		
Course Objectives	Build on the advanced undergraduate level course PHYS3550, this course mathematical techniques in statistical mechanics through special topics and apcourse to better prepare students for their postgraduate studies in physics or oth	plications. It serve	es as an elective
Course Contents	Topics include: Statistical ensembles for isolated and open systems. Equilibriu	m fluctuations. Or	der and disorder

& Topics	phase tra	phase transition. Mean field and Landau theory. Classical ideal gas, quantum ideal gas. Quantum fluid.						
Course Learning	On succe	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 d	describe and explain th	ne fundamental physical princip	oles				
	CLO 2 a	apply these principles,	together with logical and math	ematical reasoning, to situations	of the physical world			
	CLO 3 a	analyses and solve pro	oblems with the aids of mathem	natics				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in F	Pass in PHYS3550						
Offer in 2020 - 2021	Y 1s	st sem Offer in 2021	- 2022 : N	Examination	Dec			
Grade Descriptors (A+ to F)	A	learning outcomes. Sho	w strong analytical and critical abilities	tensive knowledge and skills required for as and logical thinking, with evidence of or and unfamiliar situations. Apply highly effor	riginal thought, and ability			
	В							
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.							
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.							
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.							
Course Type	Lecture-l	based course						
Course Teaching	Activitie	es	Details	No. of Hours				
& Learning Activities	Lectures	3			36			
	Tutorials	3			12			
	Reading	/ Self study			80			
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignm	nents		20	CLO 1,2,3			
	Examina	ation	3-hour written exam	50	CLO 1,2,3			
	Test			30	CLO 1,2,3			
Required/recommended reading and online materials			rse Coordinator e: Statistical Mechanics, 3rd ed	dition (Academic Press, 2011)				

	Solid s	tate physics (6 credit	ts)	Academic Year	2020			
Offering Department	Physics		•	Quota				
Course Co-ordinator	Prof M H	Xie, Physics (mhxie@hk	ru.hk)					
Teachers Involved	(Prof M I	H Xie,Physics)						
Course Objectives	topics wi	This course covers a broad introduction to modern theory of the solid state physics. Some selected advance topics will also be discussed. This is an elective course for the theoretical and experimental physics themes. This is also an essential course for those who plan to pursue postgraduate studies in condensed matter, solid staphysics and material science or to work in related industries.						
Course Contents & Topics	Crystal s free elec	Crystal structures and symmetry; the reciprocal lattice and X-ray diffraction; lattice vibration and thermal properties free electron of metals; band structures and Bloch theory; nearly free electrons and tight binding model; electronic and optical properties; semi-classical model of electron dynamics; if time permits, topics of semiconductor physics quantum Hall effect, superconductivity will also be covered.						
Course Learning	On succe	On successful completion of this course, students should be able to:						
Outcomes	CLO 1	demonstrate knowledge for	or crystal structures and characterize	ation				
	CLO 2	describe the behavior of s	solid matter and explain the underlying	ng physical concepts				
	CLO 3	apply physical principles a	and mathematical equations to discu	iss the physical properties of	f materials			
			miconductors, quantum Hall effect a					
(and Co-requisites and Impermissible combinations)								
Offer in 2020 - 2021	Y 1s	st sem Offer in 2021 - 20	122 · Y	Examination	Dec			
	Y 1s	learning outcomes. Show st	O22 : Y tery at an advanced level of extensive kno rong analytical and critical abilities and logic ide range of complex, familiar and unfamili	al thinking, with evidence of origina	al thought, and ability			
Grade Descriptors		Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a wi presentational skills. Demonstrate substantial col learning outcomes. Show ev	tery at an advanced level of extensive kno rong analytical and critical abilities and logic ide range of complex, familiar and unfamili mmand of a broad range of knowledge and ridence of analytical and critical abilities and I	owledge and skills required for attall thinking, with evidence of original ar situations. Apply highly effective skills required for attaining at least ogical thinking, and ability to apply	aining all the course al thought, and ability e organizational and at most of the course			
Grade Descriptors	A	Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a wip presentational skills. Demonstrate substantial collearning outcomes. Show evand some unfamiliar situation Demonstrate general but in outcomes. Show evidence	tery at an advanced level of extensive knot rong analytical and critical abilities and logic ide range of complex, familiar and unfamili mmand of a broad range of knowledge and ridence of analytical and critical abilities and I ns. Apply effective organizational and preser noomplete command of knowledge and ski of some analytical and critical abilities and I	whedge and skills required for attall thinking, with evidence of original ar situations. Apply highly effective skills required for attaining at least ogical thinking, and ability to apply tatational skills. Ills required for attaining most of ogical thinking, and ability to apply the skills.	aining all the course al thought, and ability e organizational and at most of the course knowledge to familiar the course learning			
Offer in 2020 - 2021 Grade Descriptors (A+ to F)	В	Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a wipresentational skills. Demonstrate substantial conlearning outcomes. Show evand some unfamiliar situation Demonstrate general but if outcomes. Show evidence of familiar situations. Apply mo Demonstrate partial but limit Show evidence of some coh-	tery at an advanced level of extensive known analytical and critical abilities and logic ide range of complex, familiar and unfamilial mmand of a broad range of knowledge and ridence of analytical and critical abilities and I ms. Apply effective organizational and preser noomplete command of knowledge and ski	whedge and skills required for atta al thinking, with evidence of origina ar situations. Apply highly effectiv skills required for attaining at leas ogical thinking, and ability to apply tational skills. ills required for attaining most of logical thinking, and ability to apply attonal skills. red for attaining some of the cours halytical and critical abilities. Show	aining all the course al thought, and ability e organizational and st most of the course knowledge to familiar the course learning y knowledge to most e learning outcomes.			
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Grade Descriptors (A+ to F)	A B C D Fail	Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a wipresentational skills. Demonstrate substantial conlearning outcomes. Show evand some unfamiliar situation Demonstrate general but if outcomes. Show evidence of familiar situations. Apply mo Demonstrate partial but limit Show evidence of some cohknowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and based course	tery at an advanced level of extensive known analytical and critical abilities and logic ide range of complex, familiar and unfamilial mmand of a broad range of knowledge and ridence of analytical and critical abilities and I ms. Apply effective organizational and presern complete command of knowledge and ski of some analytical and critical abilities and I derately effective organizational and presented command of knowledge and skills requirement and logical thinking, but with limited ares. Apply limited or barely effective organizatic lence of command of knowledge and skills requirement and logical thinking, but with limited ares. Apply limited or barely effective organizatic lence of command of knowledge and skills requirement and logical and coherent thinking. Show	whedge and skills required for attal thinking, with evidence of original ar situations. Apply highly effective skills required for attaining at least ogical thinking, and ability to apply thational skills. It is required for attaining most of logical thinking, and ability to apply attonal skills. The for attaining some of the course allytical and critical abilities. Show and and presentational skills. The for attaining some of the course leaf the course l	aining all the course al thought, and ability e organizational and st most of the course knowledge to familiar the course learning y knowledge to most e learning outcomes. limited ability to apply rming outcomes. Lack			
Grade Descriptors (A+ to F) Course Type Course Teaching	A B C D Fail	Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a wipresentational skills. Demonstrate substantial conservation of the searning outcomes. Show evand some unfamiliar situation Demonstrate general but if outcomes. Show evidence of familiar situations. Apply mo Demonstrate partial but limit Show evidence of some conknowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and based course	tery at an advanced level of extensive knorning analytical and critical abilities and logic ide range of complex, familiar and unfamiliar mmand of a broad range of knowledge and ridence of analytical and critical abilities and I ms. Apply effective organizational and present complete command of knowledge and skil of some analytical and critical abilities and I derately effective organizational and present ted command of knowledge and skills requirement and logical thinking, but with limited ares. Apply limited or barely effective organizational conference of command of knowledge and skills resilities, logical and coherent thinking. Show presentational skills are minimally effective organizational skills	whedge and skills required for attal thinking, with evidence of original ar situations. Apply highly effective skills required for attaining at least ogical thinking, and ability to apply thational skills. It is required for attaining most of logical thinking, and ability to apply attonal skills. The for attaining some of the course allytical and critical abilities. Show and and presentational skills. The for attaining some of the course leaf the course l	aining all the course al thought, and ability e organizational and at most of the course knowledge to familiar the course learning y knowledge to most e learning outcomes. limited ability to apply rning outcomes. Lack knowledge to solve			
Grade Descriptors (A+ to F) Course Type Course Teaching	A B C D Fail Lecture-I Activitie	Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a wipresentational skills. Demonstrate substantial conservation of the searning outcomes. Show evand some unfamiliar situation Demonstrate general but if outcomes. Show evidence of familiar situations. Apply mo Demonstrate partial but limit Show evidence of some conknowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and based course	tery at an advanced level of extensive knorning analytical and critical abilities and logic ide range of complex, familiar and unfamiliar mmand of a broad range of knowledge and ridence of analytical and critical abilities and I ms. Apply effective organizational and present complete command of knowledge and skil of some analytical and critical abilities and I derately effective organizational and present ted command of knowledge and skills requirement and logical thinking, but with limited ares. Apply limited or barely effective organizational conference of command of knowledge and skills resilities, logical and coherent thinking. Show presentational skills are minimally effective organizational skills	whedge and skills required for attal thinking, with evidence of original ar situations. Apply highly effective skills required for attaining at least ogical thinking, and ability to apply thational skills. It is required for attaining most of logical thinking, and ability to apply attonal skills. The for attaining some of the course allytical and critical abilities. Show and and presentational skills. The for attaining some of the course leaf the course l	aining all the course at thought, and ability e organizational and at most of the course knowledge to familiar the course learning y knowledge to most e learning outcomes. Imited ability to apply mining outcomes. Lack knowledge to solve			
Grade Descriptors	A B C D Fail Lecture-I Activitie Lectures Tutorials	Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a wipresentational skills. Demonstrate substantial conservation of the searning outcomes. Show evand some unfamiliar situation Demonstrate general but if outcomes. Show evidence of familiar situations. Apply mo Demonstrate partial but limit Show evidence of some conknowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and based course	tery at an advanced level of extensive knorning analytical and critical abilities and logic ide range of complex, familiar and unfamiliar mmand of a broad range of knowledge and ridence of analytical and critical abilities and I ms. Apply effective organizational and present complete command of knowledge and skil of some analytical and critical abilities and I derately effective organizational and present ted command of knowledge and skills requirement and logical thinking, but with limited ares. Apply limited or barely effective organizational conference of command of knowledge and skills resilities, logical and coherent thinking. Show presentational skills are minimally effective organizational skills	whedge and skills required for attal thinking, with evidence of original ar situations. Apply highly effective skills required for attaining at least ogical thinking, and ability to apply thational skills. It is required for attaining most of logical thinking, and ability to apply attonal skills. The for attaining some of the course allytical and critical abilities. Show and and presentational skills. The for attaining some of the course leaf the course l	aining all the course al thought, and ability e organizational and st most of the course knowledge to familiar the course learning y knowledge to most e learning outcomes. limited ability to apply ming outcomes. Lack knowledge to solve No. of Hours 36			

and Weighting			course grade (%)	Methods to CLO Mapping
	Assignments		20	CLO 1,2,3,4
	Examination	2-hour written exam	60	CLO 1,2,3,4
	Test		20	CLO 1,2,3,4
reading and	Lecture notes provided by course C. Kittel: Introduction to solid state N.W. Ashcroft and D.N. Mermin: S	physics (John Wiley, 1996).	nd Winston, 1987).	

PHYS4650	Stellar p	hysics (6 credits)		Academic Yea	r 2020		
Offering Department	Physics			Quota			
Course Co-ordinator	Dr S C Y	Ng, Physics (ncy@astro	.physics.hku.hk)	<u>'</u>			
Teachers Involved	(Dr S C Y	S C Y Ng, Physics)					
Course Objectives	stresses o	o introduce the basic theory of stellar structure and evolution. It follows a vigorous mathematical treatment that resses on the underlying physical processes. Knowledge in quantum mechanics and statistical mechanics will be dvantageous.					
Course Contents & Topics	stellar rad sequence explosion and plane	pics include: Definition of stars. The H-R diagram. Stellar structure equations. Polytropic model. Elementary llar radiation processes. Simple stellar nuclear processes. Saha equation. Stability of stars. Zero-age main quence stars and their evolution. The solar neutrino problem. Late stage evolution of stars. Supernova plosion. If time permits, special topics selected from below will be briefly mentioned: star formation, brown dwarfs d planets, AGB stars and planetary nebulae, binary stars and their evolution, Cepheid variables and theory of llar pulsation, and introduction to helioseismology.					
Course Learning			course, students should be abl	le to:			
Outcomes	CLO 1 de	escribe what is stars and	to classify different types of s		ncluding the use of		
	CLO 3 cr	ellar structure equations itically examine the physically stars	•	stars and how these processes a	ffect the evolution		
	CLO 4 as	ssess selected research	papers in the field of stellar as	strophysics			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in P	HYS3351 and PHYS365	:1				
Offer in 2020 - 2021	N Off	er in 2021 - 2022 : Y		Examination			
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	В						
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve						
			presentational skills are minimally eff		, 3		
Course Type	Lecture-b	ased course					
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading	/ Self study			80		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents		10	CLO 1,2,3,4		
	Examinat	tion	2-hour written exam	60	CLO 1,2,3		
	Project re	eports		10	CLO 1,2,3,4		
	Test			20	CLO 1,2,3		
Required/recommended reading and online materials	Prialnik, D A. C. Phill Bowers, F	D.: An introduction to the lips, The Physics of Stars R. & Deeming, T.: Astrop	theory of stellar structure and s (John Wiley & Sons, 1999) hysics I. Stars (Jones and Bar				
Course Website			to Stellar Astrophysics (Wiley	, 2010)			
COURSE WEDSITE	l ιπτρ://wwv	v.physics.hku.hk/~phys4	/UCO				

PHYS4651	Selected topics in astrophysics (6 credits)	Academic Year	2020
Offering Department	Physics	Quota	
Course Co-ordinator	Prof K S Cheng, Physics (hrspksc@hku.hk)		
Teachers Involved	(Prof K S Cheng, Physics)		
Course Objectives	To introduce students some current topics in astrophysics. It may be taken background to research work in astrophysics.	as a self-contain	ed course or as
Course Contents & Topics	Topics include: Brief review of thermodynamical equilibrium, radiation mechani of shock wave. Properties of Cosmic rays. Physics of compact stellar objects neutron stars and quark stars. Elements of cosmology: classical and relativisti parameters.	including black hol	es, white dwarfs
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 apply physics principles to describe the physical properties of various as	strophysical syster	ns

Required/recommended reading and online materials Course Website	Test Lecture S. L. Sha B. W. Ca 2nd editi	arroll & D. A. Ostlie: A	olsky: Black Holes, White Dwa	arfs and Neutron Stars (John trophysics (Addison-Wesley I		33)	
reading and	Test Lecture S. L. Sha	apiro and S. A. Teuko	olsky: Black Holes, White Dwa	arfs and Neutron Stars (John		33)	
Required/recommended	Test	notes provided by Co	urse Coordinator	20		GLO 1,2,3	
		auon		20		CLO 1,2,3 CLO 1,2,3	
	Present	, ,		15		CLO 1,2,3	
		ory reports		7		CLO 1,2,3	
	Examina			50		CLO 1,2,3	
	Assignn	nents		8	1	co CLO Mappin CLO 1,2,3	
Assessment Methods and Weighting	Method	ls	Details	Weighting in course grade	€ (%)	Assessment Methods	
	Reading	g / Self study				80	
	Tutorials	S				8	
	Laborat	ory				8	
& Learning Activities	Lectures	S				36	
Course Teaching	Activities		Details			No. of Hours	
Course Type	Lecture	with laboratory compo	onent course				
	Fail Nowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply					
	С	outcomes. Show evide		vledge and skills required for attair I abilities and logical thinking, and a al and presentational skills.			
	В	learning outcomes. Sh and some unfamiliar si	ow evidence of analytical and critica ituations. Apply effective organizatio		oility to apply	knowledge to familia	
Grade Descriptors (A+ to F)	A	learning outcomes. Sh to apply knowledge to presentational skills.	now strong analytical and critical abits a wide range of complex, familia	extensive knowledge and skills red ilities and logical thinking, with evide or and unfamiliar situations. Apply h	nce of original	al thought, and abilit e organizational and	
Offer in 2020 - 2021		offer in 2021 - 2022 : N			ination		
Pre-requisites (and Co-requisites and Impermissible combinations)							
Ove vervieltee		systems and their dynamic interactive processes Pass in PHYS3551 or PHYS3450 or PHYS3550 or PHYS3651					
	CLO 3 demonstrate knowledge and discuss the underlying physical concepts associated with the astrophysical						

PHYS4652	Planeta	ary science (6 credit	s)	Academic Year	2020	
Offering Department	Physics	,	•	Quota		
Course Co-ordinator	Dr M H L	ee, Physics (mhlee@hk	u.hk)	·		
Teachers Involved	(Dr M H I	Lee,Physics)				
Course Objectives		This course provides students with a modern advanced-level understanding of the properties of our Solar Syste and planetary systems around other stars and of the physical, chemical, and geological processes that government				
Course Contents & Topics		Terrestrial planets, giant planets, moons and minor bodies in our Solar System; planetary dynamics; energy transport; planetary atmospheres, surfaces, and interiors; planet formation; extrasolar planets.				
Course Learning	On succe	essful completion of this	course, students should be able to:			
Outcomes	а	and experiments	our Solar System and extrasolar plar		ugh observations	
	CLO 2 e	explain essential element	ts of the processes governing the pro	operties of planetary bodies		
		apply physical principles evolution of planetary boo	s to construct models for some badies	sic aspects of the structure	e, formation and	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in F	PHYS3651 or (PHYS335	0 and PHYS3550)			
Offer in 2020 - 2021	N Of	ffer in 2021 - 2022 : Y		Examination		
Grade Descriptors (A+ to F)	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the counterming outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and abilit to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational are presentational skills.				
		B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familia and some unfamiliar situations. Apply effective organizational and presentational skills.				
	В	learning outcomes. Show e	evidence of analytical and critical abilities and	logical thinking, and ability to apply	st most of the course	
	С	learning outcomes. Show e and some unfamiliar situati Demonstrate general but outcomes. Show evidence	evidence of analytical and critical abilities and	logical thinking, and ability to apply ntational skills. kills required for attaining most of logical thinking, and ability to appl	st most of the course knowledge to familia	
		learning outcomes. Show e and some unfamiliar situati Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lin Show evidence of some co	evidence of analytical and critical abilities and ons. Apply effective organizational and prese incomplete command of knowledge and sl of some analytical and critical abilities and	logical thinking, and ability to apply ntational skills. It ills required for attaining most of logical thinking, and ability to appl tational skills. irred for attaining some of the cours nalytical and critical abilities. Show	st most of the course knowledge to familial the course learning y knowledge to most the learning outcomes.	
	С	learning outcomes. Show e and some unfamiliar situati Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lin Show evidence of some co knowledge to solve probler Demonstrate little or no ev of analytical and critical a	evidence of analytical and critical abilities and ons. Apply effective organizational and prese incomplete command of knowledge and si of some analytical and critical abilities and oderately effective organizational and presen nited command of knowledge and skills requ wherent and logical thinking, but with limited a	logical thinking, and ability to apply ntational skills. illis required for attaining most of logical thinking, and ability to appl tational skills. irred for attaining some of the cours nalytical and critical abilities. Show ional and presentational skills. required for attaining the course lear wery little or no ability to apply	st most of the course knowledge to familian the course learning y knowledge to most be learning outcomes. limited ability to apply rming outcomes. Lack	
Course Type	C D Fail	learning outcomes. Show e and some unfamiliar situati Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lin Show evidence of some co knowledge to solve probler Demonstrate little or no ev of analytical and critical a	evidence of analytical and critical abilities and ons. Apply effective organizational and prese incomplete command of knowledge and sl of some analytical and critical abilities and oderately effective organizational and presenited command of knowledge and skills requesterent and logical thinking, but with limited ans. Apply limited or barely effective organizatidence of command of knowledge and skills abilities, logical and coherent thinking. Sho	logical thinking, and ability to apply ntational skills. illis required for attaining most of logical thinking, and ability to appl tational skills. irred for attaining some of the cours nalytical and critical abilities. Show ional and presentational skills. required for attaining the course lear wery little or no ability to apply	st most of the course knowledge to familian the course learning y knowledge to most be learning outcomes. limited ability to apply rming outcomes. Lack	
	C D Fail	learning outcomes. Show e and some unfamiliar situations. Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lin Show evidence of some con knowledge to solve problem Demonstrate little or no ev of analytical and critical a problems. Organization and based course	evidence of analytical and critical abilities and ons. Apply effective organizational and prese incomplete command of knowledge and sl of some analytical and critical abilities and oderately effective organizational and presenited command of knowledge and skills requesterent and logical thinking, but with limited ans. Apply limited or barely effective organizatidence of command of knowledge and skills abilities, logical and coherent thinking. Sho	logical thinking, and ability to apply ntational skills. illis required for attaining most of logical thinking, and ability to appl tational skills. irred for attaining some of the cours nalytical and critical abilities. Show ional and presentational skills. required for attaining the course lear wery little or no ability to apply	st most of the course knowledge to familian the course learning y knowledge to most be learning outcomes. limited ability to apply rming outcomes. Lack	
Course Teaching	C D Fail	learning outcomes. Show e and some unfamiliar situations. Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lin Show evidence of some con knowledge to solve probler Demonstrate little or no evidence of analytical and critical a problems. Organization and based course	evidence of analytical and critical abilities and ons. Apply effective organizational and prese incomplete command of knowledge and si of some analytical and critical abilities and oderately effective organizational and presenited command of knowledge and skills requirement and logical thinking, but with limited ans. Apply limited or barely effective organizatidence of command of knowledge and skills abilities, logical and coherent thinking. Sho d presentational skills are minimally effective	logical thinking, and ability to apply ntational skills. illis required for attaining most of logical thinking, and ability to appl tational skills. irred for attaining some of the cours nalytical and critical abilities. Show ional and presentational skills. required for attaining the course lear wery little or no ability to apply	st most of the course knowledge to familian the course learning y knowledge to most the learning outcomes. Limited ability to apply rrning outcomes. Lack knowledge to solve	
Course Type Course Teaching & Learning Activities	C D Fail Lecture-t Activitie	learning outcomes. Show e and some unfamiliar situation Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lin Show evidence of some content of the solution	evidence of analytical and critical abilities and ons. Apply effective organizational and prese incomplete command of knowledge and si of some analytical and critical abilities and oderately effective organizational and presenited command of knowledge and skills requirement and logical thinking, but with limited ans. Apply limited or barely effective organizatidence of command of knowledge and skills abilities, logical and coherent thinking. Sho d presentational skills are minimally effective	logical thinking, and ability to apply ntational skills. illis required for attaining most of logical thinking, and ability to appl tational skills. irred for attaining some of the cours nalytical and critical abilities. Show ional and presentational skills. required for attaining the course lear wery little or no ability to apply	st most of the course knowledge to familial the course learning y knowledge to most se learning outcomes. Lack knowledge to solve	

Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		20	CLO 1,2,3
	Essay		15	CLO 1,2,3
	Examination	2-hour written exam	50	CLO 1,2,3
	Test		15	CLO 1,2,3
Required/recommended reading and online materials		Coordinator netary Sciences (Cambridge Univ. F Gilmour: An Introduction to the Sola		iversity Press, 2011,
Course Website	http://moodle.hku.hk			

PHYS4653	Cosmol	ogy (6 credits)			Academic Year	2020	
Offering Department	Physics Quota				Quota		
Course Co-ordinator		K M Lee, Physics (kmlee@lily.physics.hku.hk)					
Teachers Involved	(Dr K M L	ee,Physics)					
Course Objectives	mathemat	The aim of the course is to offer an advanced introduction to cosmology, to familiarize students with the nathematical formulation used to model the evolution and dynamics of the universe, and to provide an up to date iscussion of the big bang theory and structure and galaxy formation.					
Course Contents & Topics	bang mod	opics include: The visible universe. Empirical basis for cosmological theories. The metric of the universe. The big ang models. Thermodynamics of the early universe. Primordial nucleosynthesis. The very early universe. Iflationary models. The cosmological constant problem. Structure and galaxy formation.					
Course Learning Outcomes	CLO 1 ap CLO 2 ex CLO 3 de	a successful completion of this course, students should be able to: _O 1 apply physics principles to describe the observational/experimental aspects of cosmology _O 2 explain the observed phenomena of cosmology _O 3 demonstrate knowledge and discuss the underlying physical concepts associated with the cosmologic evolution of the universe and with the dynamic interactive processes that take place in the universe					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Pl	HYS3651 or PHYS3652					
Offer in 2020 - 2021	Y 2nd	l sem Offer in 2021 - 2	022 : N		Examination	May	
Grade Descriptors (A+ to F)	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the coulearning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and at to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational presentational skills.				nal thought, and ability	
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the cour learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to famil and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С						
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	3	Details			No. of Hours	
& Learning Activities	Lectures					36	
	Tutorials					12	
	Reading /	Self study				80	
Assessment Methods and Weighting	Methods		Details		nting in final se grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents			20	CLO 1,2,3	
	Examinat				50	CLO 1,2,3	
	Test				30	CLO 1,2,3	
Required/recommended reading and online materials	M. Lachie M. Rowan	otes provided by Course ze-Rey: Cosmology: A F i-Robinson: Cosmology	First Course (Cambridg (Clarendon Press, Oxfo	ord, 1996)	,		
0		ng: Relativity, Gravitation	n & Cosmology - A Bas	ic introduction (Oxford	, ∠005)		
Course Website	nttp://moo	dle.hku.hk					

PHYS4654	Genera	relativity (6 credits)		Academic Year	2020
Offering Department	Physics			Quota	
Course Co-ordinator	Dr M Su,	Physics (mengsu84@hku.hk)			
Teachers Involved	(Dr M Su	Physics)			
Course Objectives		ice students to the field of generally size and cosmological applica	al relativity. To provide conceptual tions of the theory.	skills and analytica	l tools necessary
Course Contents & Topics	covariant	differentiation. The Riemann ter	rvers in a curved space-time. Vector nsor. The matter tensor. The Einste tational waves detected by LIGO.		
Course Learning	On succe	ssful completion of this course, s	tudents should be able to:		
Outcomes		CLO 1 apply the mathematical and physical ideas of the theory of general relativity for the study of various systems in astrophysics and cosmology			
	CLO 2 explain the observational effects at the scale of the Solar System that cannot be described by Newtonian gravity from a general relativistic point of view				
	CLO 3 d	monstrate knowledge and discu	ss the dynamic interactive physical p	processes in astropl	hysics by using a

		general relativistic ap	proach				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in PHYS2055 and PHYS3350						
Offer in 2020 - 2021	Y 1:	Y 1st sem Offer in 2021 - 2022 : Y Examination Dec					
Grade Descriptors (A+ to F)	A	learning outcomes. Šh	n mastery at an advanced level of extens now strong analytical and critical abilities ar o a wide range of complex, familiar and u	nd logical thinking, with evidence of or	iginal thought, and ability		
	В	learning outcomes. Sh and some unfamiliar s	tial command of a broad range of knowled now evidence of analytical and critical abilitie ituations. Apply effective organizational and	es and logical thinking, and ability to ap I presentational skills.	pply knowledge to familiar		
	С	outcomes. Show evide	but incomplete command of knowledge ence of some analytical and critical abilitie by moderately effective organizational and	es and logical thinking, and ability to a			
	D						
	Fail	of analytical and criti-	o evidence of command of knowledge and cal abilities, logical and coherent thinking n and presentational skills are minimally eff	a. Show very little or no ability to ap			
Course Type	Lecture-	based course					
Course Teaching	Activities		Details	Details			
& Learning Activities	Lecture	S			36		
	Tutorial	S			12		
	Reading	g / Self study			80		
Assessment Methods and Weighting	Method	Is	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignr	nents		20	CLO 1,2,3		
	Examin	ation	2-hour written exam	60	CLO 1,2,3		
	Test			20	CLO 1,2,3		
Required/recommended reading and online materials	R. M. W T. A. Mo J. B. Ha	Lest 20 CLO 1,2,3 Lecture notes provided by Course Coordinator R. M. Wald: General Relativity (University of Chicago Press, 1984) T. A. Moore: A General Relativity Workbook (Univ Science Books, 2012) J. B. Hartle: Gravity: An Introduction to Einstein's General Relativity (Addison-Wesley 2003) B. Schutz: A First Course in General Relativity (Cambridge University Press, 2009)					
Course Website		oodle.hku.hk	Sonoral Molativity (Sambillage Office	5.5.5, 1.1005, 2000)			
rounds fromotio	map.//iii	Journal III					

	Interste	llar medium (6 cred	its)	Aca	demic Year	2020	
Offering Department	Physics Quota						
Course Co-ordinator	Dr M H L	r M H Lee, Earth Sciences (mhlee @hku.hk)					
Teachers Involved	(Dr M H L	(Dr M H Lee, Physics)					
Course Objectives	absorptio	This course provides students with an advanced-level understanding of the processes responsible for the absorption and emission of continuum and line radiation from gas and dust in stellar atmospheres and interstella space, and their astrophysical applications and implications.					
Course Contents & Topics	Gas, dus	Gas, dust, atoms, molecules, radiation; physical and radiative properties of hydrogen, helium and heavier elements; hydrogen clouds, molecular clouds; HII regions, nebulae, supernovae.					
Course Learning	On succe						
Dutcomes		•	een stars in spiral and elliptic				
	CLO 2 a	•	to describe excitation/ioniza		/recombinatio	on of atoms an	
		ecognize which process nedium	or processes occur or don	minate in which objec	t or phase o	f the interstella	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in P	PHYS3651 or (PHYS335	1 and PHY3550)				
Offer in 2020 - 2021	Y 1st	t sem Offer in 2021 - 2	.022 : N	Exa	mination	Dec	
Grade Descriptors (A+ to F)	A	learning outcomes. Show s	stery at an advanced level of exter strong analytical and critical abilities wide range of complex, familiar and	and logical thinking, with ev	idence of origina	al thought, and abilit	
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the cou learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to family and some unfamiliar situations. Apply effective organizational and presentational skills.					
			ons. Appry enective organizational al	no presentational skills.		knowledge to familia	
	С	Demonstrate general but outcomes. Show evidence	incomplete command of knowledge of some analytical and critical abili oderately effective organizational and	e and skills required for at ities and logical thinking, ar		the course learnin	
	C D	Demonstrate general but outcomes. Show evidence familiar situations. Apply modern Demonstrate partial but lim Show evidence of some co	incomplete command of knowledge of some analytical and critical abili	e and skills required for at ities and logical thinking, ar d presentational skills. kills required for attaining so limited analytical and critica	d ability to apply me of the course abilities. Show I	the course learning knowledge to mose learning outcome	
		Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lim Show evidence of some co knowledge to solve problem Demonstrate little or no evi of analytical and critical a	incomplete command of knowledge of some analytical and critical abili oderately effective organizational an- nited command of knowledge and sk herent and logical thinking, but with	e and skills required for at tities and logical thinking, ar d presentational skills. kills required for attaining so limited analytical and critica organizational and presentati d skills required for attainin ng. Show very little or no	me of the course abilities. Show lonal skills. g the course lear	the course learning / knowledge to mose learning outcomes imited ability to apprining outcomes. Lac	
	D Fail	Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lim Show evidence of some co knowledge to solve problem Demonstrate little or no evi of analytical and critical a	incomplete command of knowledge of some analytical and critical ability oderately effective organizational and inted command of knowledge and skillerent and logical thinking, but with ms. Apply limited or barely effective of idence of command of knowledge are abilities, logical and coherent thinking	e and skills required for at tities and logical thinking, ar d presentational skills. kills required for attaining so limited analytical and critica organizational and presentati d skills required for attainin ng. Show very little or no	me of the course abilities. Show lonal skills. g the course lear	the course learnin / knowledge to mose e learning outcomes imited ability to app ning outcomes. Lac knowledge to solv	
Course Teaching	D Fail	Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lim Show evidence of some co knowledge to solve problem Demonstrate little or no evi of analytical and critical a problems. Organization and passed course	incomplete command of knowledge of some analytical and critical ability oderately effective organizational and inted command of knowledge and skillerent and logical thinking, but with ms. Apply limited or barely effective of idence of command of knowledge are abilities, logical and coherent thinking	e and skills required for at tities and logical thinking, ar d presentational skills. kills required for attaining so limited analytical and critica organizational and presentati d skills required for attainin ng. Show very little or no	me of the course abilities. Show lonal skills. g the course lear	the course learnin / knowledge to mose e learning outcome imited ability to app rning outcomes. Lac	
Course Teaching	D Fail	Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lim Show evidence of some co knowledge to solve problem Demonstrate little or no evi of analytical and critical a problems. Organization and assed course	incomplete command of knowledge of some analytical and critical abili oderately effective organizational an inited command of knowledge and skilberent and logical thinking, but with ms. Apply limited or barely effective of idence of command of knowledge arbibilities, logical and coherent thinking presentational skills are minimally expressions.	e and skills required for at tities and logical thinking, ar d presentational skills. kills required for attaining so limited analytical and critica organizational and presentati d skills required for attainin ng. Show very little or no	me of the course abilities. Show lonal skills. g the course lear	the course learnin / knowledge to mo e learning outcome imited ability to app ning outcomes. Lac knowledge to solv	
Course Teaching	D Fail Lecture-b	Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lim Show evidence of some co knowledge to solve problem Demonstrate little or no evi of analytical and critical a problems. Organization and passed course	incomplete command of knowledge of some analytical and critical abili oderately effective organizational an inited command of knowledge and skilberent and logical thinking, but with ms. Apply limited or barely effective of idence of command of knowledge arbibilities, logical and coherent thinking presentational skills are minimally expressions.	e and skills required for at tities and logical thinking, ar d presentational skills. kills required for attaining so limited analytical and critica organizational and presentati d skills required for attainin ng. Show very little or no	me of the course abilities. Show lonal skills. g the course lear	the course learnin / knowledge to mo e learning outcome imited ability to app ning outcomes. Lac knowledge to solv	
Course Teaching	D Fail Lecture-b Activitie Lectures Tutorials	Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lim Show evidence of some co knowledge to solve problem Demonstrate little or no evi of analytical and critical a problems. Organization and passed course	incomplete command of knowledge of some analytical and critical abili oderately effective organizational an inited command of knowledge and skilberent and logical thinking, but with ms. Apply limited or barely effective of idence of command of knowledge arbibilities, logical and coherent thinking presentational skills are minimally expressions.	e and skills required for at tities and logical thinking, ar d presentational skills. kills required for attaining so limited analytical and critica organizational and presentati d skills required for attainin ng. Show very little or no	me of the course abilities. Show lonal skills. g the course lear	the course learning / knowledge to mo e learning outcome imited ability to apprining outcomes. Lacknowledge to solv No. of Hours 36	
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	D Fail Lecture-b Activitie Lectures Tutorials	Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lim Show evidence of some co knowledge to solve problem Demonstrate little or no evi of analytical and critical a problems. Organization and passed course s	incomplete command of knowledge of some analytical and critical abili oderately effective organizational an inited command of knowledge and skilberent and logical thinking, but with ms. Apply limited or barely effective of idence of command of knowledge arbilities, logical and coherent thinking by presentational skills are minimally expressions.	e and skills required for at tities and logical thinking, ar d presentational skills. kills required for attaining so limited analytical and critica organizational and presentati d skills required for attainin ng. Show very little or no	me of the course abilities. Show I onal skills. g the course lead ability to apply in final ade (%)	the course learnin / knowledge to mo e learning outcome imited ability to app ning outcomes. Lac knowledge to solv No. of Hours 36 12	

	Essay		15	CLO 1,2,3		
	Examination	2-hour written exam	50	CLO 1,2,3		
	Test		15	CLO 1,2,3		
	, , , ,					
reading and online materials	S. Kwok: Physics and Chemistry of the Interstellar Medium (University Sciences Book, 2007)					

PHYS4656	Advance	ed astrophysics (6	credits)	Academic Yea	ar 2020		
Offering Department	Physics			Quota			
Course Co-ordinator	TBA, Phys	sics ()					
Teachers Involved							
Course Objectives	include ra introductio physical p	Built on PHYS3653, this course covers selected astrophysics topics at the advanced undergraduate level. Foci include radiation mechanism and high energy processes, basic theory of stellar structure and evolution, and introduction to compact objects. It follows a vigorous mathematical treatment that stresses on the underlying physical processes. This is an elective course for the astrophysics theme. This is also an essential course for those who plan to pursue postgraduate studies in astrophysics.					
Course Contents & Topics	processes	; simple stellar nuclear	nisms; stellar structure equations processes; stellar formation; late dditional selected topics will be co	stage of stellar evolution; su			
Course Learning	On succes	sful completion of this	course, students should be able to	0:			
Outcomes	CLO 1 de	scribe what is stars an	d to classify different types of star	S			
	CLO 2 an		solve problems related to the stru		ncluding the use of		
		tically examine the phystars	ysical processes occurring in star	s and how these processes a	affect the evolution		
			o describe the physical properties				
	sy	stems and their dynam	and discuss the underlying phys ic interactive processes		n the astrophysical		
			n papers in the field of stellar astro	physics			
Pre-requisites (and Co-requisites and Impermissible combinations)	rass III ri	1133031 01 F1113303.	3 or (PHYS3351 and PHYS3450)				
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : Y		Examination			
Grade Descriptors (A+ to F)	B C D	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familia and some unfamiliar situations. Apply effective organizational and presentational skills. Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to mos familiar situations. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
Course Type		ased course	Dataila		No of Harries		
Course Teaching & Learning Activities	Activities		Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials	Colf atudy			12 80		
Accomment Mather!		Self study	Deteile	Mainhtin - In fine			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme		1	10	CLO 1,2,3,4,5		
	Examinati		2-hour written exam	60	CLO 1,2,3,4,5		
	Presentat	ion		10	CLO 1,2,3,4,5,6		
	Test			20	CLO 1,2,3,4,5		
Required/recommended reading and online materials	Prialnik, D Shapiro ar	nd S. A. Teukolsky Lon	e Coordinator e theory of stellar structure and ev gair High Energy Astrophysics 3ro n to Stellar Astrophysics (Wiley, 20	d ed			

PHYS4750	Experimental physics (6 credits)	Academic Year	2020
Offering Department	Physics	Quota	
Course Co-ordinator	TBC, Physics ()		
Teachers Involved	(TBC,Physics)		
Course Objectives	TBC		
Course Contents & Topics	TBC		
Course Learning Outcomes	On successful completion of this course, students should be able to:		
Pre-requisites (and Co-requisites and Impermissible combinations)	TBC		
Offer in 2020 - 2021	N Offer in 2021 - 2022 : N	Examination	

Grade Descriptors (A+ to F)	A			
	В			
	С			
	D			
	Fail			
Course Type	Lecture with laboratory	component course		
Course Teaching & Learning Activities	Activities	Details		No. of Hours
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
Required/recommended reading and online materials	TBC			

PHYS4850	Particle	physics (6 cre	edits)		Academic Year	2020	
Offering Department	Physics		<u> </u>		Quota		
Course Co-ordinator	Dr Y J Tu,	Physics (yanjuni	tu@hku.hk)				
Teachers Involved	(Dr Y J Tu	ı,Physics)					
Course Objectives			theoretical and experimental a			an elective cours	
			for their postgraduate studies in				
Course Contents	Topics include: fundamental particles and interactions, symmetry and conservation law, tree lev						
& Topics	diagrams, gauge theory SU(3)XSU_L(2)XU_Y(1), Higgs mechanism (basic idea of the spontaneous symmetry breaking and the goldstone boson equivalence theorem), particle accelerator and detector, Higgs discovery experiment.						
Course Learning	On succes	ssful completion of	of this course, students should b	e able to:			
Outcomes	CLO 1 de	escribe and expla	in the fundamental physical prin	ciples for the standard	model of particle	physics.	
		pply these principocesses.	ples, together with logical and	mathematical reason	ing, to analyze	particle physics	
	CLO 3 ca	pture the frontier	and progress of particle physics	S.			
Pre-requisites	Pass in Pl	HYS3351					
(and Co-requisites and Impermissible							
combinations)							
Offer in 2020 - 2021	Y 2nd	sem Offer in 2	2021 - 2022 : Y		Examination	May	
Grade Descriptors	Α		ugh mastery at an advanced level of			,	
(A+ to F)	to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most						
	familiar situations. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply the state of some organizational control productions and productions of the course learning outcomes.						
	Fail knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	3	Details	Details			
& Learning Activities	Lectures					36	
	Tutorials					12	
	Reading /	Self study				80	
Assessment Methods and Weighting	Methods		Details		ing in final grade (%)	Assessment Methods to CLO Mappin	
	Assignments				20	CLO 1,2,3	
	Examinat				50	CLO 1,2,3	
	Test				30	CLO 1,2,3	
Required/recommended	Lecture no	est 30 CLO 1,2,3 ecture notes provided by Course Coordinator M. Henley and A. Garcia, Subatomic Physics, 3rd Ed., World Scientific, 2007					

PHYS4966	Physics internship (6 credits)	Academic Year	2020			
Offering Department	Physics	Quota				
Course Co-ordinator	Dr J C S Pun, Physics (jcspun@hku.hk)					
Teachers Involved	(NIL,Physics)					
Course Objectives	This capstone course is offered to students majoring in physics, physics (intensity should be taken normally in the summer immediately before their final year of opportunity to gain working experience in the field of physics or astronomy throexpected to use what they have learnt in their majors in this intern.	study. It provides	students with the			
Course Contents & Topics	Students will work as an intern for at least 160 hours within the University or outside the University in a company, government department or NGO. The work nature must be related to physics or astronomy. The internship should be arranged by the Department or obtained by students themselves. In the latter case, it must be approved before the commencement of the internship.					
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 apply physics or astronomy knowledge that students have learnt environment	in their majors	to real working			

	CLO 2 help to create, propose or design part of the project that they are working on during the internship CLO 3 employ effective technical and inter-personal communication skills to people of different background,							
		culture, gender and nationality						
Pre-requisites (and Co-requisites and Impermissible combinations)	Major, Physi This capstor only.	ass in at least 24 credits of advanced level (3XXX level or above) disciplinary core/elective courses of the Physics lajor, Physics (Intensive) Major, Mathematics/Physics Major or Astronomy Major curriculum. his capstone course is for Astronomy, Mathematics/Physics, Physics, and Physics (Intensive) Majors students						
Offer in 2020 - 2021	Y Sumn				Examination	No Exam		
Grade Descriptors (Pass /Pass with distinction /Fail)	Distincti on	performance in handling and corrying out the work required in the job or accigned by supervisor(a). Established highly						
	Pass	Able to apply knowledge to solve problems in the workplace. Successfully handles and carries out the work required in the job or assigned by supervisor(s). Establishes effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc. Students demonstrating excellent performance in the above would be awarded a grade of "Distinction".						
	Fail Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required in the job or assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other colleagues, or clients in the job. Fails to satisfy the requirements set out in the Course Description regarding working hours, written and oral report, or evaluation by supervisor(s), etc.							
Course Type	Internship							
Course Teaching	Activities		Details			No. of Hours		
& Learning Activities	Internship w	ork	it is expected that students are to work at least 160 hours (or the equivalent of 4 weeks full-time)		160			
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Written report		written report, er feedback and oral pre-	nployer's sentation	100	CLO 1,2,3		
Required/recommended reading and online materials	To be provid	ed by individual proje	ct supervisor					
Additional Course Information	be recorded interested to Enrolment o	on the student's tra enrol in this course s f this course is not co	nscript. This course wi hould contact the Depai nducted via the online of	ill be assess rtment to obta course select	ostone requirement. Deta ed on "Pass/Fail" basis. ain the approval. ion system and should b om the course coordinato	Students who are e made through the		

PHYS4999	Physics project (12 credits)	Academic Year	2020					
Offering Department	Physics Quota							
Course Co-ordinator	Dr J J L Lim, Physics (jjlim@hku.hk)							
Teachers Involved	(Various teachers in the department,Physics)							
Course Objectives	This capstone course is offered to students majoring in physics, physics (in is designed for those who are interested in tackling a research project in paken normally in their final year of study. It provides students with the opp themselves, either theoretical, experimental or numerical, under the superknowledge the student gained in all years of his/her major study. The available level research in physics and/or astronomy.	physics and/or astrono portunity to study a sp rvision of an academ	omy. It should be ecific problem by ic staff using the					
Course Contents & Topics	Students interested in taking this course should contact their prospective contents and the nature of their projects in the coming academic year. The prospective supervisor and the course coordinator to take this course.							
	For theoretical and numerical projects: Students will receive training in research literature reading and reviewing, and make investigation which is close to research work in nature, under the supervision of a staff member. The student may need to perform some original calculations, to fill in mathematical gaps of some sophisticated derivations, or a combination of both. For numerical projects, students also need to use computers to find numerical or simulation results.							
	For experimental projects: Students will carry out experiments in research member. The student will receive a comprehensive training in advance preparation of samples, determination of physical properties, measuremer laser, high-vacuum and low-temperature techniques and so on. Wide read and originality in experimental design are expected.	ed experimental techn nt of small signals ob	niques, including scured by noise,					
Course Learning	On successful completion of this course, students should be able to:							
Outcomes	CLO 1 plan and execute a theoretical, numerical or experimental research project on a topic in physics or astronomy							
	CLO 2 review the knowledge of a physics or astronomy problem in depth through literature review of books and research journals based on what they have learnt in their majors							
	CLO 3 criticize existing approaches for solving the selected physics or astronomy problem							
	CLO 4 describe and explain connections between the physical principles and the study problem							
	CLO 5 (for theoretical or computational projects) identify the key issues of the problem and solve them independently either by analytical or numerical means, and compare the results with predictions or existing solutions							
	CLO 6 (for experimental projects) propose and execute physics experiments or astronomical observations, analyze results and sources of errors of the experiment or observation in comparison with predictions							
	CLO 7 (for projects involving team work) collaborate and communicate effectively in the team, which may comprise of people of different culture, gender and nationality							
Pre-requisites (and Co-requisites and Impermissible	Pass in at least 24 credits of advanced level (3XXX level or above) disciplina Major, Physics (Intensive) Major, Mathematics/Physics Major or Astronomy In This capstone course is for Astronomy, Mathematics/Physics, Physics, and Astronomy, Mathematics/Physics, Physics, and Physics, and Physics, and Physics, Physics, and Physics, Physics, Astronomy, Mathematics/Physics, Physics, Physics, Astronomy, Mathematics/Physics, Physics, Ph	Major curriculum.	,					

combinations)	only. The earliest that a student is allowed to take this capstone course is their year 3 study.					
Offer in 2020 - 2021	Y Yea	ar long Offer in 2021 -	2022 : Y	Examination	n No Exam	
Grade Descriptors (A+ to F)	Α	Demonstrate thorough grasp of the subject. Show strong analytical and critical abilities and logical thinking, with evidence of original thought. Insightful use and critical analysis/evaluation of information drawn from a full range of high quality sources and to quote/reference aptly. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills. Work of A+ should show considerable additional work beyond that is required in wider areas relevant to the topic.				
	В	Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Critical use of relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.				
	С	Use of relevant informatio quote/reference aptly. Mos	complete grasp of the subject. Evidence n from sources, showing ability to matty correct but some erroneous use of tational and presentational skills.	ake comparisons between differe	nt interpretations and to	
	D	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Demonstrate use and reference of several sources, but mainly through summary rather than analysis and comparison. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.				
	Fail	analytical and critical abilities	ittle or no grasp of the knowledge and es, logical and coherent thinking. Limit results and/or unable to draw appropri ctive.	ed use of secondary sources and	no critical comparison of	
Course Type	Project-ba	ased course				
Course Teaching	Activities	_	Details	No. of Hours		
& Learning Activities	Meeting v	with supervisor		54		
	Reading	/ Self study			126	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Oral presentation		including supervisor's comments (10%)	30	CLO 2,4,5,6	
	Research	n report		70	CLO 1,2,3,4,5,6,7	
Required/recommended reading and online materials	To be pro	vided by individual proje	ct supervisor			

PHYS7350	Gradua	Graduate classical mechanics (6 credits) Academic Year 2020						
Offering Department	Physics				Quota			
Course Co-ordinator	TBC, Phy	ysics ()						
Teachers Involved	(TBC,Ph	ysics)						
Course Objectives	TBC							
Course Contents & Topics	TBC							
Course Learning Outcomes	On succe	essful completion of	f this course, students shoul	d be able to:				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in F	Pass in PHYS4350						
Offer in 2020 - 2021	N Of	ffer in 2021 - 2022 :	N		Examination			
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course							
	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.							
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.							
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.							
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.							
Course Type	Lecture-b	pased course						
Course Teaching & Learning Activities	Activitie	es	Details			No. of Hours		
Assessment Methods and Weighting	Methods		Details		ting in final e grade (%)	Assessment Methods to CLO Mapping		
Required/recommended reading and online materials	TBC							

PHYS7351	Graduate quantum mechanics (6 credits) Academic Year 202				
Offering Department	Physics	Quota			
Course Co-ordinator	Prof S Q Shen, Physics (sshen@hku.hk)				
Teachers Involved	(Prof S Q Shen, Physics)				
Course Objectives	This course introduces postgraduates and senior undergraduates to theory and advanced techniques in quantum mechanics, and their applications to select topics in condensed matter physics.				
Course Contents	The course will cover the following topics: Dirac notation, quantum dynamics,	the second quanti	zation, symmetry		

& Topics	and conservation laws, permutation symmetry and identical particles, perturbation and scattering theory, introduction of relativistic quantum mechanics.						
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1	formulate and solve pro	blems in quantum mechanics	using Dirac notation			
	CLO 2		properties of identical quantu				
	CLO 3		f symmetry and conservation I				
	CLO 4	explain physical phenor	nena in the modern language	of quantum mechanics			
	CLO 5	analyse physical systen	n in a quantum mechanical wa	ν			
	CLO 6	recognise the connection	n between relativity and quan	tum mechanics			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in I	PHYS4351					
Offer in 2020 - 2021	Y 2r	nd sem Offer in 2021 - 2	2022 : Y	Examination	May		
Grade Descriptors (A+ to F)	A	learning outcomes. Show s	trong analytical and critical abilities a	sive knowledge and skills required for and logical thinking, with evidence of or unfamiliar situations. Apply highly effe	iginal thought, and ability		
	В	Demonstrate substantial command of the knowledge and skills required for attaining most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-	based course					
Course Teaching	Activitie	es	Details		No. of Hours		
& Learning Activities	Lectures	3		36			
	Tutorials	3			12		
	Reading / Self study				80		
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm	nents		40	CLO 1,2,3,4,5,6		
	Examina	ation	3-hour written exam	60	CLO 1,2,3,4,5,6		
Required/recommended reading and online materials	J. J. Sak		echanics (Addison-Wesley, 19	994)			

PHYS7450	Graduat	te electromagn	etism (6 credits)	Academic Year	2020		
Offering Department	Physics			Quota			
Course Co-ordinator	Prof Z D V	Nang, Physics <i>(z</i> ห	/ang@hku.hk)				
Teachers Involved	(Prof Z D	Wang,Physics)					
Course Objectives				vanced level of comprehending on the al tools for solving real physics probler			
Course Contents & Topics	Function	This course will introduce and discuss the following topics: Boundary-value problems in electrostatics and Green Function method, Electrostatics of Media, Magnetostatics, Maxwell's equations and conservation laws, Gauge transformations, Electromagnetic waves and wave guides.					
Course Learning	On succes	ssful completion of	f this course, students should b	e able to:			
Outcomes	CLO 1 ar	nalyse and solve v	arious electrostatic and magne	tostatic problems with Green's Functio	n		
	CLO 2 cc	omprehend and ex	plain many electromagnetic ph	enomena			
			orehend the important concepts ful for doing research in future	of conservation laws and gauge trans	formations, which		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in P	Pass in PHYS4450					
Offer in 2020 - 2021	Y 1st	sem Offer in 202	21 - 2022 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the cours learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familia and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lac of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading	/ Self study			80		
	r todding /	och stady			00		

and Weighting			course grade (%)	Methods to CLO Mapping		
	Assignments		40	CLO 1,2,3		
	Examination	3-hour written exam	60	CLO 1,2,3		
Required/recommended reading and online materials	J.D. Jackson: Classical Electrodynamics (John Wiley & Sons, 1999) L.D. Landau and E.M. Lifshitz: Classical Theory of Fields (Pergamon, 1982)					

PHYS7550	Graduate statistical mechanics (6 credits) Academic Y				Academic Year	2020		
Offering Department	Physics				Quota			
Course Co-ordinator	Dr G Chen, Physics (gangchen@hku.hk)							
Teachers Involved	(Dr G Chen, Physics)							
Course Objectives	This course intends to introduce some advanced topics in the field of equilibrium statistical physics.							
Course Contents & Topics	Ensemble theory: the micro-canonical ensemble, the canonical ensemble, and the grand canonical ensemble Quantum mechanical ensemble theory. Theory of simple gases, ideal Bose systems, ideal Fermi systems Statistical mechanics of interacting systems. Some topics in the theory of phase transition may be selected.							
Course Learning	On successful completion of this course, students should be able to:							
Outcomes	CLO 1 discuss the various classical ensembles and quantum ensembles							
	CLO 2 solve the statistical mechanics problems using ensemble theory							
	CLO 3 explain the connection between classical statistical mechanics and quantum statistical mechanics							
	CLO 4 explain the concept of density matrix							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Ph							
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	2022 : Y		Examination	May		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.							
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.							
Course Type	Lecture-based course							
Course Teaching	Activities Details			No. of Hours				
& Learning Activities	Lectures					36		
_	Tutorials					12		
	Reading /	Self study				80		
Assessment Methods and Weighting	Methods		Details		e grade (%)	Assessment Methods to CLO Mapping		
	Assignments				40	CLO 1,2,3,4		
	Examination		3-hour written exam		60	CLO 1,2,3,4		
Required/recommended reading and online materials	Lecture notes provided by Course Coordinator R.K. Pathria: Statistical mechanics M. Plischke and B. Bergersen: Equilibrium statistical physics							

PHYS7551	Graduate solid state physics (6 credits)			Academic Year	2020			
Offering Department	Physics			Quota				
Course Co-ordinator	Prof J V	Prof J Wang, Physics (jianwang@hku.hk)						
Teachers Involved								
Course Objectives	To provide students with an understanding of more advanced topics in selected areas of solid state physics.							
Course Contents & Topics	Bloch theory. Nearly free electrons and tight binding model. Band structure calculations for realistic systems. The semi-classical model of electron dynamics. Ab initio total energy calculations and other advanced topics.							
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 discuss various methods to calculate the band structures and the major approximations that have been used							
	CLO 2 discuss various minimization methods							
	CLO 3 discuss the concepts of density functional theory							
	CLO 4 explain the concept of first principle calculation and various approximations used							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in PHYS3551 and PHYS4351							
Offer in 2020 - 2021	N C	Offer in 2021 - 2022 : N		Examination				
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.							
	B Demonstrate substantial command of the knowledge and skills required for attaining most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.							
	С	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning						

		familiar situations. Apply m skills and techniques.	oderately effective organizational a	ities and logical thinking, and ability to a and presentational skills. Apply moderat	ely effective observation
	D	Show evidence of some coh	nerent and logical thinking, but with	kills required for attaining some of the co limited analytical and critical abilities. Sh rganizational and presentational skills.	
	Fail		nd skills required for attaining the course ing. Show very little or no ability to ap effective or ineffective.		
Course Type	Lecture-ba	ased course			
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Lectures			36	
	Tutorials			12	
	Reading / Self study				80
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignme	ents		15	CLO 1,2,3,4
	Examinat	ion	3-hour written exam	70	CLO 1,2,3,4
	Test			15	CLO 1,2,3,4
Required/recommended reading and online materials	C. Kittel: I		Coordinator e Physics (John Wiley, 1996 Solid State Physics (Holt, Rin		

PHYS7650	Stellar atmospheres (6 credits) Academic Year 2020						
Offering Department	T Tryoto						
Course Co-ordinator	TBC, Phys	TBC, Physics ()					
Teachers Involved	(TBC,Physics)						
Course Objectives	TBC						
Course Contents	TBC						
& Topics							
Course Learning Outcomes	On successful completion of this course, students should be able to:						
Pre-requisites (and Co-requisites and Impermissible combinations)	TBC						
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : N			Examination		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	В	Demonstrate substantial command of the knowledge and skills required for attaining most of the course learning outcomes. Show evidence of analytical and critical abilities, reasoned logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations using effective organizational and presentation skills.					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Apply moderately effective observation skills and techniques. Mostly correct but some erroneous use of data and results to draw appropriate conclusions.						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems using limited or barely effective organizational and presentational skills.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-ba	sed course					
Course Teaching & Learning Activities	Activities		Details			No. of Hours	
Assessment Methods and Weighting	Methods		Details		ing in final grade (%)	Assessment Methods to CLO Mapping	
Required/recommended reading and online materials	TBC						

PHYS7750	Nanoph	/sics (6 credits)		Academic Year	2020	
Offering Department	Physics Quota					
Course Co-ordinator	Dr D K K	Physics (dkki@hku.hk)				
Teachers Involved	(Dr D K k	,Physics)				
Course Objectives	physics,	This course is designed to let fresh postgraduate students know fundamental concepts and principles of nano physics, such as two-dimensional electron gas, quantum Hall effects, one-dimensional electron system, quantum wires and nanotubes, zero-dimensional electron systems, single electron effects and quantum dots.				
Course Contents & Topics	propertie external and semi Quantum	wires and nanotubes, zero-dimensional electron systems, single electron effects and quantum dots. Introduction to nano physics and quantum size effect. Dimensionalities and density of states. Optical and transport properties of two-dimensional electron gas formed at heterostructures and within novel graphene monolayers with external fields. Quantum Hall Effects. Physics of one-dimensional electron systems including carbon nanotubes and semiconductor nanowires. Fundamental physics of zero-dimensional electron systems. Single electron effects. Quantum dots and nanocrystals. Fundamental principles and applications of scanning tunneling microscopy in the study of nano physics. If time permits, the making and application aspects of nanomaterials will also be discussed.				
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 re	call basic concepts and knowled	lge of dimensionality, density of state	s, quantum size eff	ect	
	CLO 2 identify and compare optical and transport properties of two-dimensional electron gas with external fields, especially quantum Hall effects					
	CLO 3	cognize the fundamental princip	oles and important applications of so	anning tunneling m	nicroscopy in the	

	s	tudy of nano physics					
			sics of one-dimension	al electron systems including carb	on nanotubes and		
	semiconductor nanowires						
			•	nal quantum dots and nanocrystals, si	ngle electron effects		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in F	Pass in PHYS3551 and PHYS4351					
Offer in 2020 - 2021	Y 1s	t sem Offer in 2021 - 20	022 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	Α	learning outcomes. Show st to apply knowledge to a w presentational skills.	trong analytical and critical a ride range of complex, famil	of extensive knowledge and skills required fo abilities and logical thinking, with evidence of on liar and unfamiliar situations. Apply highly eff-	riginal thought, and ability ective organizational and		
	В	learning outcomes. Show ev	vidence of analytical and criti	knowledge and skills required for attaining at cal abilities and logical thinking, and ability to a tional and presentational skills.			
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	of analytical and critical at	bilities, logical and coheren	edge and skills required for attaining the course t thinking. Show very little or no ability to a imally effective or ineffective.			
Course Type	Lecture-b	pased course					
Course Teaching	Activitie	s	Details		No. of Hours		
& Learning Activities	Lectures			36			
	Tutorials				12		
	Reading	/ Self study			80		
Assessment Methods and Weighting	Methods	5	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm	ents		10	CLO 1,2,3,4,5		
	Essay			20	CLO 1,2,3,4,5		
	Examina	tion		70	CLO 1,2,3,4,5		
Required/recommended reading and online materials	Lecture r	otes prepared by Course	e Coordinator	·			

ENVS3006	Environ	mental radiation (6 cred	its)	Academic Year	2020			
Offering Department	Physics							
Course Co-ordinator	Dr J K C I	eung, Physics (jkcleung@hk	u.hk)					
Teachers Involved	(Dr J K C	Leung,Physics)						
Course Objectives	to detect	In this course, students will learn about various kinds of radiations in the environment, the experimental techniques to detect them, the methods to trace them and to assess their hazard to the environment, and the ways to reduce the hazard in events of nuclear accidents or incidents.						
Course Contents & Topics	power pla	The course will cover naturally occurring radiation sources and man-made radiation sources including nuclear power plants; transport models for radionuclides in the environment; nuclear accidents and its impact to the environment; radiation risk assessment and emergency preparedness; techniques for measuring low level radioactivities; nuclear techniques in ecology; concept of radiation protection to human species and non-human species						
Course Learning	On succe	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 r	ealise sources and transport	of radionuclides in the environ	ment				
		•	to the environment from the u					
			radioactivities in environmenta					
	CLO 4 ju	stify, optimize, and assess th	e risk of using radiation and n	uclear technologies				
			ronmental impacts from nucle		fenergy			
land Caramilalitas								
(and Co-requisites and Impermissible combinations)	N Off	er in 2021 - 2022 · N		Examination	I			
and Impermissible	N Off	learning outcomes. Show strong a to apply knowledge to a wide ra presentational skills. Apply highly	t an advanced level of extensive kn nalytical and critical abilities and logi nge of complex, familiar and unfami effective lab skills and techniques. (cal thinking, with evidence of original liar situations. Apply highly effective	nal thought, and ability we organizational and			
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	-	Demonstrate thorough mastery a learning outcomes. Show strong a to apply knowledge to a wide ra presentational skills. Apply highly insightful conclusions. Demonstrate substantial comman learning outcomes. Show evidence and some unfamiliar situations. At	inalytical and critical abilities and loginge of complex, familiar and unfamil effective lab skills and techniques. (dof a broad range of knowledge and e of analytical and critical abilities and poly effective organizational and press	owledge and skills required for at cal thinking, with evidence of origin liar situations. Apply highly effective Critical use of data and results to d skills required for attaining at lea logical thinking, and ability to apply	nal thought, and ability we organizational and draw appropriate and st most of the course whowledge to familiar			
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Α	Demonstrate thorough mastery a learning outcomes. Show strong a to apply knowledge to a wide ra presentational skills. Apply highly insightful conclusions. Demonstrate substantial comman learning outcomes. Show evidence and some unfamiliar situations. Af Correct use of data of results to dr Demonstrate general but incomp outcomes. Show evidence of son familiar situations. Apply moderate	nalytical and critical abilities and loginge of complex, familiar and unfamil effective lab skills and techniques. Of the defensive lab skills and techniques. Of the defensive lab skills and techniques. Of the defensive lab letties and properties	owledge and skills required for at cal thinking, with evidence of origin liar situations. Apply highly effective critical use of data and results to d skills required for attaining at lea logical thinking, and ability to apply entational skills. Apply effective lab kills required for attaining most of logical thinking, and ability to appentational skills. Apply moderately expenses the second statement of the second statement of the second	all thought, and ability ve organizational and draw appropriate and st most of the course knowledge to familiar skills and techniques. If the course learning by knowledge to most			
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	В	Demonstrate thorough mastery a learning outcomes. Show strong a to apply knowledge to a wide ra presentational skills. Apply highly insightful conclusions. Demonstrate substantial comman learning outcomes. Show evidence and some unfamiliar situations. Af Correct use of data of results to dr. Demonstrate general but incompoutcomes. Show evidence of son familiar situations. Apply moderate techniques. Mostly correct but son Demonstrate partial but limited co Show evidence of some coherent knowledge to solve problems. Ap	inalytical and critical abilities and loginge of complex, familiar and unfamile effective lab skills and techniques. (If a broad range of knowledge and of a proad range of the abilities and oply effective organizational and preseaw appropriate conclusions. Ielet command of knowledge and stee analytical and critical abilities and lea analytical and critical abilities and	owledge and skills required for at cal thinking, with evidence of original tributions. Apply highly effective critical use of data and results to discount of skills required for attaining at lead logical thinking, and ability to apply entational skills. Apply effective lab kills required for attaining most of logical thinking, and ability to apply entational skills. Apply moderately to draw appropriate conclusions. Irred for attaining some of the coursulaytical and critical abilities. Show attonal and presentational skills.	al thought, and ability we organizational and draw appropriate and st most of the course v knowledge to familiar skills and techniques. If the course learning ly knowledge to most effective lab skills and see learning outcomes. limited ability to apply			
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	B C	Demonstrate thorough mastery a learning outcomes. Show strong a to apply knowledge to a wide ra presentational skills. Apply highly insightful conclusions. Demonstrate substantial comman learning outcomes. Show evidence and some unfamiliar situations. At Correct use of data of results to dr Demonstrate general but incompoutcomes. Show evidence of son familiar situations. Apply moderate techniques. Mostly correct but son Demonstrate partial but limited co Show evidence of some coherent knowledge to solve problems. Ap lab skills and techniques. Limited a Demonstrate little or no evidence of analytical and critical abilities, problems. Organization and prese	malytical and critical abilities and loginge of complex, familiar and unfamil effective lab skills and techniques. Of the defensive lab skills and techniques. Of the defensive lab skills and techniques. Of the defensive lab littles and present and properties and properties and properties and properties and properties and properties and properties and properties and properties and properties and properties and properties and properties and properties and properties and properties and properties and properties and properties and logical thinking, but with limited a ply limited or barely effective organization of companies.	owledge and skills required for at cal thinking, with evidence of origin liar situations. Apply highly effective critical use of data and results to d skills required for attaining at lea logical thinking, and ability to apply entational skills. Apply effective lab kills required for attaining most of logical thinking, and ability to appentational skills. Apply moderately to draw appropriate conclusions. Sirred for attaining some of the coursultical and critical abilities. Show attoinal and presentational skills. A appropriate conclusions. required for attaining the course lea w very little or no ability to apply or ineffective. Apply minimally effe	all thought, and ability we organizational and draw appropriate and st most of the course knowledge to familiar skills and techniques. If the course learning by knowledge to most effective lab skills and se learning outcomes. Ilimited ability to apply pply partially effective arning outcomes. Lack knowledge to solve			
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	B C D	Demonstrate thorough mastery a learning outcomes. Show strong a to apply knowledge to a wide ra presentational skills. Apply highly insightful conclusions. Demonstrate substantial comman learning outcomes. Show evidence and some unfamiliar situations. At Correct use of data of results to dr Demonstrate general but incompoutcomes. Show evidence of son familiar situations. Apply moderate techniques. Mostly correct but son Demonstrate partial but limited co Show evidence of some coherent knowledge to solve problems. Ap lab skills and techniques. Limited a Demonstrate little or no evidence of analytical and critical abilities, problems. Organization and prese	inalytical and critical abilities and loginge of complex, familiar and unfamile effective lab skills and techniques. Of the dof a broad range of knowledge and of a proper of the dof analytical and critical abilities and only effective organizational and preseaw appropriate conclusions. Hete command of knowledge and sile analytical and critical abilities and ely effective organizational and prese the erroneous use of data and results to mand of knowledge and skills requand logical thinking, but with limited a loyl limited or barely effective organizationity to use data and results to draw of command of knowledge and skills logical and coherent thinking. Short national skills are minimally effective that and results to draw of command of knowledge and skills are minimally effective that and results and/or unable to draw the descriptions.	owledge and skills required for at cal thinking, with evidence of origin liar situations. Apply highly effective critical use of data and results to d skills required for attaining at lea logical thinking, and ability to apply entational skills. Apply effective lab kills required for attaining most of logical thinking, and ability to appentational skills. Apply moderately to draw appropriate conclusions. Sirred for attaining some of the coursultical and critical abilities. Show attoinal and presentational skills. A appropriate conclusions. required for attaining the course lea w very little or no ability to apply or ineffective. Apply minimally effe	all thought, and ability we organizational and draw appropriate and st most of the course knowledge to familiar skills and techniques. If the course learning by knowledge to most effective lab skills and se learning outcomes. Ilimited ability to apply pply partially effective arning outcomes. Lack knowledge to solve			

& Learning Activities	Lectures			36
	Laboratory			2
	Field work			8
	Tutorials			8
	Reading / Self study			80
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		20	CLO 1,2,4,5
	Examination	2-hour written exam	60	CLO 1,2,4,5
	Laboratory reports		10	CLO 2,3
	Presentation		10	CLO 2,4,5
Required/recommended reading and online materials	Merril Eisenbud and Thomas Ge (Academic Press, 1997) Robert C. Morris: The Environmer David Bodansky: Nuclear Energy	ر atal Case for Nuclear Power (Paraç	gon House, 2000)	•
Course Website	http://moodle.hku.hk			

ENVS3010	Sustainable energy and environment (6 credits) Academ				r 2020	
Offering Department	Physics		,	Quota		
Course Co-ordinator	Prof A B	Djurisic, Physics (dalek@	Dhku.hk)			
Teachers Involved	(Prof A B	Djurisic,Physics)				
Course Objectives	technolog technolog	In this course, the students will learn about sustainability and environmental impact of different energy technologies, including conventional energy sources as well as renewable and/or clean energy sources. The technological challenges, potential for future development, and environmental impacts (community, regional, an global) will be discussed.				
Course Contents & Topics	making th	The course will cover energy production and use, environmental impact of energy use, fossil fuels and methods for making them more sustainable, clean fuels, electricity generation, renewable energy technologies (with emphasis on biomass, wind and solar energy), hydrogen, energy storage, and energy conservation.				
Course Learning	On succe	essful completion of this of	course, students should be able to:			
Outcomes	CLO 1	define the concept of su	stainable development			
	CLO 2	explain the challenges a	ind potential for development of var	ious energy technologies		
	CLO 3	compare the environme	ntal impact of conventional and nev	v energy technologies		
Pre-requisites (and Co-requisites and Impermissible combinations)			or ENVS2002 or PHYS2260			
Offer in 2020 - 2021	Y 2n	d sem Offer in 2021 - 2	2022 : Y	Examination	May	
Grade Descriptors (A+ to F)	В	learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.				
	С	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
		outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
					y knowledge to solv	
		pased course				
Course Teaching	Activitie	s	Details		No. of Hours	
Course Teaching	Activitie Lectures	es .	Details		No. of Hours	
Course Teaching	Activitie Lectures Tutorials	es	Details		No. of Hours 36 12	
Course Teaching	Activitie Lectures Tutorials	es .	Details		No. of Hours	
Course Teaching & Learning Activities Assessment Methods	Activitie Lectures Tutorials	s / Self study	Details Details	Weighting in final course grade (%)	No. of Hours 36 12 80 Assessment Methods	
Course Teaching & Learning Activities Assessment Methods	Activitie Lectures Tutorials Reading	es / Self study s		Weighting in final	No. of Hours 36 12 80 Assessment Methods	
Course Teaching & Learning Activities Assessment Methods	Activitie Lectures Tutorials Reading Methods	/ Self study	Details	Weighting in final course grade (%)	No. of Hours 36 12 80 Assessment Methods to CLO Mapping	
Course Teaching & Learning Activities Assessment Methods	Activitie Lectures Tutorials Reading Methods	es Section 1 Self study Section 1	Details debate questions performance	Weighting in final course grade (%)	No. of Hours 36 12 80 Assessment Methods to CLO Mappin CLO 1,2,3	
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	Activitie Lectures Tutorials Reading Methods Assignm Examina Presenta	/ Self study s eents tion	Details debate questions performance 2-hour written exam	Weighting in final course grade (%) 10 50	No. of Hours 36 12 80 Assessment Methods to CLO Mappin CLO 1,2,3 CLO 1,2,3	
Course Teaching & Learning Activities Assessment Methods and Weighting	Activitie Lectures Tutorials Reading Methods Assignm Examina Presenta Lecture n Godfrey I G. Boyle Open Un	/ Self study Senents S	Details debate questions performance 2-hour written exam	Weighting in final course grade (%) 10 50 40 Oxford University Press, 20 nability: Power for a Sustain	No. of Hours 36 12 80 Assessment Methods to CLO Mappin CLO 1,2,3 CLO 1,2,3 CLO 2,3	

ENTR2001	Professi	ional and lead	dership (Professional and leadership development (6 credits) Academic Yea			
Offering Department	Faculty				Quota	24	
Course Co-ordinator	Dr R Law,	, Faculty (rockyla	aw @hku.h	k)			
Teachers Involved	(Dr R Law	,Faculty of Scier	nce)				
		/d,CEDARS)					
Course Objectives	This course is to provide opportunity for: 1. Students to develop an entrepreneurial mindset and be better prepared for entering into any entrepreneurial environment 2. Students to further sharpen their communication skills, such as presentation and pitching of ideas 3. Students to further enhance their networking skills, such as in social events 4. Students to understand how different personalities and working / leadership styles fit into team work						
					· · ·		
Course Contents & Topics	with platfo	This course aims at increasing students' awareness of some important entrepreneurial skills and providing ther with platforms to hone essential skills necessary to succeed as a leader in operating an entrepreneurial venture. One of the course components will also allow students to self-reflect and develop practical sense on how differer personalities and work styles can help build leadership capacity as well as foster stronger team collaboration.					
Course Learning Outcomes	CLO 1 ac CLO 2 ga CLO 3 sh ne	On successful completion of this course, students should be able to: CLO 1 acquire basic knowledge about how different personalities and working / leadership styles fit into team wor CLO 2 gain insight into the fundamentals of starting and operating a business by meeting industry practitioners CLO 3 sharpen their communication and career preparation skills in CV and cover letter writing, interview, networking, presentation, negotiation, group discussion, case analysis and problem solving CLO 4 recognize and adapt work style differences to establish stronger relationships at workplace in a startur					
		ompany	'	,	, ,		
Pre-requisites (and Co-requisites and Impermissible combinations)	Any level	1 undergraduate	course				
Offer in 2020 - 2021	Y 1st	sem Offer in 2	2021 - 202	2 : Y	Examination	No Exam	
Grade Descriptors	Α			emonstrated a thorough understanding and	skills required for attaining	all the course learning	
(A+ to F)	outcomes. S/he has shown the ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. S/he has demonstrated highly effective organizational and presentation skills. Candidate frequently demonstrated a substantial understanding and skills required for attaining at least most of the course learning outcomes. S/he has shown the ability to apply knowledge to familiar and unfamiliar situations. S/he has demonstrated						
	С	effective organizational and presentation skills. C Candidate demonstrated general but incomplete understanding and skills required for attaining most of the course learning outcomes. Some of the responses are well organized, clear but with insufficient elaboration – there is significant room for improvement to achieve a more satisfactory level. S/he has demonstrated moderately effective organizational and presentation skills.					
	D Candidate demonstrated partial but limited understanding and skills required for attaining some of the course learning outcome Solutions to questions and problems contain unstructured but relevant observations. Candidate has shown marginal interest the subject. S/he has demonstrated limited or barely effective organizational and presentation skills. Fail Candidate showed little or no evidence of basic familiarity with the subject, nor demonstration of sufficient effort to basic project.						
	ган		a little of the			own marginal interest	
Course Type	Lecture-ba	ased course	ement. Orgai	evidence of basic familiarity with the subject nizational and presentation skills are minimal	, nor demonstration of sufficie	own marginal interest	
Course Teaching	Lecture-based course		ement. Orga		, nor demonstration of sufficie	own marginal interest	
Course reaching	Activities				, nor demonstration of sufficie	own marginal interest	
	Activities Lectures			nizational and presentation skills are minimal	, nor demonstration of sufficie	own marginal interest	
				nizational and presentation skills are minimal	, nor demonstration of sufficie	own marginal interest nt effort to basic proje No. of Hours	
	Lectures	S		nizational and presentation skills are minimal	, nor demonstration of sufficie	own marginal interest nt effort to basic proje No. of Hours 37	
	Lectures Tutorials Project we	S		nizational and presentation skills are minimal	, nor demonstration of sufficie	own marginal interest int effort to basic proje No. of Hours 37 12	
Course Teaching & Learning Activities Assessment Methods and Weighting	Lectures Tutorials Project we	ork / Self study	į.	nizational and presentation skills are minimal	, nor demonstration of sufficie	No. of Hours 37 12 43	
& Learning Activities Assessment Methods	Lectures Tutorials Project we Reading /	s ork / Self study]]	nizational and presentation skills are minimal Details Details nclude in class and home assignments	, nor demonstration of sufficie ly effective or ineffective. Weighting in final	No. of Hours 37 12 43 42 Assessment Methods to CLO	
& Learning Activities Assessment Methods	Lectures Tutorials Project we Reading / Methods	s ork / Self study		nizational and presentation skills are minimal Details Details nclude in class and home assignments Experiential learning activities and reflective journal	, nor demonstration of sufficie ly effective or ineffective. Weighting in final course grade (%)	No. of Hours 37 12 43 42 Assessment Methods to CLO Mapping	
& Learning Activities Assessment Methods	Lectures Tutorials Project wo Reading / Methods	ork / Self study		nizational and presentation skills are minimal Details Details nclude in class and home assignments Experiential learning activities and	weighting in final course grade (%)	No. of Hours 37 12 43 42 Assessment Methods to CLO Mapping CLO 1,2,3,4	
& Learning Activities Assessment Methods	Lectures Tutorials Project we Reading / Methods Assignme Essay Project re Business a Organizati Group Dyr	ork / Self study ents and Administrational Behavior benamics by Done	I I a E r I I ive Commi y Stephen	nizational and presentation skills are minimal Details Details Details Details Details Details Details Include in class and home assignments Experiential learning activities and reflective journal include Job Application Review & Mock Interview and Group Presentation Unication by Kitty Locker and Donnal P. Robbins and Timothy A. Judge	weighting in final course grade (%) 40 10 50 a Kienzler	No. of Hours 37 12 43 42 Assessment Methods to CLO Mapping CLO 1,2,3,4	

ENTR3001	Science-based innovation development (6 credits)	Academic Year	2020
Offering Department	Faculty	Quota	24
Course Co-ordinator	Dr M Kotaka, Biomedical Sciences (masayo@hku.hk)		
Teachers Involved	(Dr A C Koon,Biomedical Sciences) (Dr M Kotaka,Biomedical Sciences)		
Course Objectives	 Stimulate students to contemplate how business opportunities can be genered. Teach students the process of translating scientific ideas to commercial challenges therein. Help students to understand the different regulatory requirements for scient opportunities, including the different stages of clinical trial required for biomedial. Inspire students to identify potential business ideas from science and tech feasible action plan for a start-up company. 	I products and/or and technology cal-related products	services and the based business structures.
Course Contents & Topics	Topics will include identification of business opportunities from science and translation of science into a commercial product, understanding the challeng products, understanding the regulatory requirements for technology-based products.	es of translating so	
Course Learning	On successful completion of this course, students should be able to:		

Outcomes	CLO 1 a	emonstrate an understa	anding on how science and technology	can generate business o	pportunities		
		cquire knowledge of th roduct	e process and stages involved in tran	slating a scientific idea	into a commercial		
		dentify the challenges of enerate solutions to tho	encountered in translating scientific id se challenges	leas into product and u	nderstand how to		
	рі	CLO 4 have a clear understanding of the different regulatory requirements for different technology-based products, as well as the different stages of clinical trials required for the development of biomedical-related products					
	CLO 5 de	CLO 5 demonstrate the ability to critically evaluate cases of science-based business success or failures in written assessments					
	de	0 0	elence and technology research to iden easible action plan to bring the scie or digital aid	,	•		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in II	MT1611 and ENTR200	1				
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021 -	2022 : Y	Examination	No Exam		
Grade Descriptors (A+ to F)	A	outcomes. S/he has show	ly demonstrated a thorough understanding and n the ability to apply knowledge to a wide range of tive organizational and presentation skills.				
	В						
	С						
	D	Candidate demonstrated partial but limited understanding and skills required for attaining some of the course learning outcomes. Solutions to questions and problems contain unstructured but relevant observations. Candidate has shown marginal interest in the subject. S/he has demonstrated limited or barely effective organizational and presentation skills.					
	Fail	Fail Candidate showed little or no evidence of basic familiarity with the subject, nor demonstration of sufficient effort to basic project					
Course Type	Locturo b		Organizational and presentation skills are minimal	lly effective or ineffective.			
Course Type		ased course	Deteile				
Course Teaching & Learning Activities	Activitie		Details		· · ·		
& Learning Activities	Lectures				No. of Hours		
	Drojectv				No. of Hours		
	Project w	vork			No. of Hours 36 40		
Accessment Matheda	Reading	vork / Self study			No. of Hours 36 40 45		
Assessment Methods and Weighting		vork / Self study	Details	Weighting in final course grade (%)	No. of Hours 36 40		
	Reading	vork / Self study s			No. of Hours 36 40 45 Assessment Methods to CLO		
Assessment Methods and Weighting Required/recommended reading and online materials	Reading Methods Assignment Entreprer Winning a	vork / Self study s ents neurship: An Innovator's at New Products: Creati	Details Project report, Presentations, Discussions and student	course grade (%) 100 tures by Marc H. Meyer t G. Cooper	No. of Hours 36 40 45 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6		
and Weighting Required/recommended reading and	Assignment Entreprer Winning a Regulator Online Ar	vork / Self study s ents neurship: An Innovator's at New Products: Creati ry Affairs for Biomateria	Details Project report, Presentations, Discussions and student performance in tutorials s Guide to Startups and Corporate Vent ng Value Through Innovation by Rober	course grade (%) 100 tures by Marc H. Meyer t G. Cooper	No. of Hours 36 40 45 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6		

ENTR3002	Customer analysis and strategic marketing (6 credits)	Academic Year	2020					
Offering Department	Faculty	Quota	24					
Course Co-ordinator	Dr R Law, Faculty (rockylaw@hku.hk)							
Teachers Involved	(Dr R Law,Faculty of Science)							
Course Objectives	This course is to provide opportunity for: 1. Students to master techniques to identify customers' needs and market situations. 2. Students to learn how to define strategies to satisfy customers' needs and to capture market shares 3. Students to learn how to develop systematic approaches for commercializing an innovation from the resanalyzing the current market condition and customers' need. 4. Students to evaluate local and international cases on disruptive/market driven innovation. 5. Students to synthesize and implement their own approaches to invent for the need and develop a bus proposal to commercialize such an innovation.							
Course Contents & Topics	This course focuses on data collection and analysis of market and custor commercial opportunities could be identified together with systematic application will learn about practical way of data collection and analysis and about hade wisely. Local and international case studies on disruptive/market drevaluated.	proaches addressing the low data-driven busines	em. The students s decision will be					
Course Learning	On successful completion of this course, students should be able to:							
Outcomes	CLO 1 to master techniques of data collection and analysis particular for market and customer analysis							
	CLO 2 to acquire knowledge of interpretation of the result of market and customer analysis, and then to define a solution to address the need by an innovative idea/new product							
	CLO 3 to synthesize systematic approaches to commercialize an innovation with regard to the existing market condition and customers' need							
	CLO 4 to analyze local and international cases on disruptive/market drive	n innovation						
	CLO 5 to integrate principles discussed in this course via synthesizing and implementing systematic approaches to commercialize an innovation							
	CLO 6 to draft a business proposal							
Pre-requisites	Pass in IIMT1611 and FNTR2001							

online materials Course Website		y Design: How Design dle.hku.hk	THIRKING Transforms OF	rganizations and Inspires Innovatior	i by Tim Brown		
Required/recommended reading and	Business	Start-Up by Eric Reis Model Generation by A			hu Tina Danna		
	Project re		report	50	CLO 1,2,3,4,5,6		
	Presentat			30	CLO 1,2,3,4,5,6		
	Assignme			20	CLO 1,2,3,4		
Assessment Methods and Weighting	Methods		Details	Weighting in fina course grade (%) Methods to CLO Mapping		
	Reading /	Self study		40			
	Project w	ork			48		
& Learning Activities	Lectures				36		
Course Teaching	Activities	3	Details	Details			
Course Type	Lecture-ba	ased course	J	,			
	Fail	Fail Candidate showed little or no evidence of basic familiarity with the subject, nor demonstration of sufficient effort to basic project and course requirement. Organizational and presentation skills are minimally effective or ineffective.					
	D	Solutions to questions and the subject. S/he has demo	d problems contain unstructur onstrated limited or barely effo	ng and skills required for attaining some of the red but relevant observations. Candidate ha ective organizational and presentation skills.	as shown marginal interest in		
	С	outcomes. Some of the r improvement to achieve a skills.	esponses are well organized more satisfactory level. S/he	erstanding and skills required for attaining d, clear but with insufficient elaboration — thas demonstrated moderately effective organization.	there is significant room for ganizational and presentation		
	В	Candidate frequently demonstrated a substantial understanding and skills required for attaining at least most of the course learning outcomes. S/he has shown the ability to apply knowledge to familiar and unfamiliar situations. S/he has demonstrated effective organizational and presentation skills.					
Grade Descriptors (A+ to F)	A	Candidate has consistently demonstrated a thorough understanding and skills required for attaining all the course learning outcomes. S/he has shown the ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. S/he has demonstrated highly effective organizational and presentation skills					
Offer in 2020 - 2021		I sem Offer in 2021 -		Examinati	· · · · · · · · · · · · · · · · · · ·		
(and Co-requisites and Impermissible combinations)							

ENTR4966	Entrepre	neurship interr	nship (6 credits)	Academic Yea	r 2020		
Offering Department	Faculty	•	· ` `	Quota	24		
Course Co-ordinator	Dr R Law, I	Faculty (rockylaw	@hku.hk)				
Teachers Involved	(All acaden	nic staff in Faculty	of Science,)				
Course Objectives	To pract environmer	This course is to provide opportunity for students: 1. To practice what they learned related to entrepreneurship through prior university coursework in real-life work environment. 2. To acquire first-hand experience in industries for the preparation of their own business ventures.					
Course Contents & Topics	Students taking this course will work as an intern for at least 160 hours in at least 20 working days University or outside the University in a company (preferably technology based startup company). The may be arranged by the Faculty or obtained by students themselves. 1. Within the university: The student will be supervised by a staff member (Supervisor), working on a pro-						
	various tas 2. Outside Supervisor	various tasks as instructed by the Supervisor. 2. Outside the university: The student will be supervised under a staff member of the external agency (the Exterr Supervisor) and a staff member of the Faculty/School /Department of the student (the Internal Supervisor).					
Course Learning Outcomes	CLO 1 to it	ntegrate and apply	this course, students should be able to / knowledge gained in coursework in a	real-life setting			
	CLO 3 to f	urther improve progain hand-on expe	ture of a real organization and challeng oblem-solving and collaborative skills in erience from external startup compan I activities that will help them to prepar	n a real-life setting ies or internal research group	about their daily		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in EN	TR3001 and ENT					
Offer in 2020 - 2021	Y Sum	mer Offer in 202	21 - 2022 : Y	Examination	No Exam		
Grade Descriptors (Pass /Pass with distinction /Fail)	Distincti on	performance in ha effective collaborate requirements set of	ellent ability in applying knowledge to solv ndling and carrying out the work required in ion and communication with supervisor(s), cru ut in the Course Description regarding working ation by supervisor(s), etc.	the job or assigned by supervisor(olleagues, and clients in the job. S	s). Establishes highly uccessfully fulfills the		
	Able to apply knowledge to solve problems in the workplace. Successfully handles and carries out the work required in the job or assigned by supervisor(s). Establishes effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc. Students demonstrating excellent performance in the above would be awarded a grade of "Distinction".						
	Fail	·					
Course Type	Internship						
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Internship	work		it is expected that students are to work at least 160 hours (or the equivalent of 4 weeks fulltime)			
	Reading /	Self study			20		
	Assessme	nt	Presentation		5		
Assessment Methods and Weighting	Reading / Self study Assessment Methods		Details	Weighting in final course grade (%)	Assessment		

				Mapping	
	Oral presentation		30	CLO 1,2,3,4	
	Supervisor's feedback	A Standardized evaluation form will be provided to internal/external supervisor	20	CLO 1,2,3,4	
	Written report		50	CLO 1,2,3,4	
Required/recommended reading and online materials	Students will be briefed with ma supervisor(s) and/or the correspon	aterials appropriate to the individual adding Faculty members.	internship assignment b	y the internship	
Course Website	http://moodle.hku.hk				
Additional Course	Students are expected to work for	at least 160 hours, supervised by a Fa	aculty member.		
Information	Students are to submit a written internship experience.	tudents are expected to work for at least 160 hours, supervised by a Faculty member. tudents are to submit a written report of no more than 2000 words, together with a presentation about the ternship experience.			

ENTR4999	Entrepre	neurship project (6	credits)	Academic Yea	ar 2020		
Offering Department	Faculty		•	Quota	24		
Course Co-ordinator	Dr R Law,	Faculty (rockylaw@hku	.hk)				
Teachers Involved	(All acader	mic staff in Faculty of Sc	ience,)				
Course Objectives	 Apply engained fro proposals. Studen 	his course is to provide opportunity for students to: Apply entrepreneurship-related knowledge gained through prior university coursework and hand-on experiences ained from prior Internship course to carry out in-depth business potential evaluation and to develop start-up roposals. Students to further develop leadership and teamwork experience via collaboration in multi-disciplinary nvironments.					
Course Contents & Topics	the superv years of st and produ result from	This course is offered to students as the final course in the minor programme in Science Entrepreneurship. Under the supervision and guidance of an academic staff, students are to use the knowledge they have gained in all ears of study to practice entrepreneurship. This can be achieved by conducting technology trend, market analysis and product identification for defining market-product fit solutions. Students are expected to participate, with the esult from their hands-on experience in projects, competitions (such as the HKU DreamCatchers initiative, various lackathon activities and "Challenge Cup" National Competition etc.) and to develop start-up companies					
Course Learning	On succes	sful completion of this c	ourse, students should be abl	e to:			
Outcomes	CLO 1 to	integrate and apply the	oretical knowledge in a real-lif	e setting			
	CLO 2 to	adopt appropriate tools	to analyze real-life entreprene	eurship issues			
	CLO 3 to	further improve present	ation, problem-solving and co	llaborative skills in tackling real-	life problems		
	CLO 4 to	build a team, with mem	bers from different specialized	d areas, that is ready for busines	ss venture		
	CLO 5 to	prepare a viable busine	ss plan that is ready for fund i	raising activities			
Pre-requisites (and Co-requisites and Impermissible combinations)		NTR3001 and ENTR300 nust be in their Year 3 s		noring in Science Entrepreneurs	ship.		
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20	22 : Y	Examination	No Exam		
Grade Descriptors (A+ to F)	A Candidate has consistently demonstrated a thorough understanding and skills required for attaining all the course learning outcomes. S/he has shown the ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. S/he has demonstrated highly effective organizational and presentation skills. B Candidate frequently demonstrated a substantial understanding and skills required for attaining at least most of the course learning outcomes. S/he has shown the ability to apply knowledge to familiar and unfamiliar situations. S/he has demonstrated effective organizational and presentation skills.						
	C Candidate demonstrated general but incomplete understanding and skills required for attaining most of the course learning outcomes. Some of the responses are well organized, clear but with insufficient elaboration – there is significant room for improvement to achieve a more satisfactory level. S/he has demonstrated moderately effective organizational and presentation skills.						
	D Candidate demonstrated partial but limited understanding and skills required for attaining some of the course learning outcomes. Solutions to questions and problems contain unstructured but relevant observations. Candidate has shown marginal interest in the subject. S/he has demonstrated limited or barely effective organizational and presentation skills. Fail Candidate showed little or no evidence of basic familiarity with the subject, nor demonstration of sufficient effort to basic project						
	Fail		panizational and presentation skills ar		ent enort to basic project		
Course Type	Project-ba	sed course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Meeting w	vith supervisor	the end of this course for brie		15		
	Reading /	Self study	Students will be working on their projects with guidance from the supervisor to build a business proposal		120		
	Assessme	ent	Presentation		5		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Dissertation		Research report	60	CLO 1,2,3,4,5		
	Oral prese	entation		40	CLO 1,2,3,4,5		
Required/recommended reading and online materials	Students w	vill be briefed with mater	ials appropriate to the project	by the project supervisor(s).			
Course Website	http://mood	dle.hku.hk					
Additional Course Information	Students a		ularly with the project supervi report or a business proposa	sor(s). al of no more than 10,000 wor	ds, together with a		

SCNC1111	Scientific method and reasoning (6 credits)	Academic Year	2020
Offering Department	Faculty	Quota	
Course Co-ordinator	Dr R K W Lui, Faculty (lui2012 @hku.hk)		
Teachers Involved	(Dr R K W Lui (Sem 1 & 2), Faculty of Science)		

Course Objectives	The objectimpact on	Or W M Y Cheung (Sem 1),Faculty of Science) The objectives are to give students a holistic view of the science discipline in terms of its nature, concepts are appact on civilization and society; to equip students with basic skills of logical and quantitative reasoning; and troduce to students mathematical and statistical methods for science studies and research.				
Course Contents & Topics	- Demarca - Shared for - Scientific	tion between scie eatures of the scie method	odology of science ence and non-science ences I the historical development of science			
	Topics selea. Mathema - Foundatie - Mathema - Guesstim - Difference - Linear ale - Calculus	Part II: Quantitative reasoning Topics selected from the following ones, which are grouped under three categories: a. Mathematics - Foundation of mathematics - Mathematics and advancement of science - an introduction - Mathematical modelling - an introduction - Guesstimation - Difference equations - Linear algebra and matrices - Calculus and differential equations - Fractals and Chaos				
	StatisticaConfidenHypothes	ty rules stic methods I inference ce intervals estim				
	c. Data An - Performir	alysis and Progra ng operations by ເ	use and misuse of statistics Imming using Microsoft Excel Using formulas and functions			
Course Learning Outcomes	On succes CLO 1 de CLO 2 de CLO 3 ide CLO 4 ap	- Managing charts On successful completion of this course, students should be able to: CLO 1 describe key aspects of scientific methodology CLO 2 describe the key elements of the foundation of mathematics and statistics CLO 3 identify the mathematics that underlies scientific problems CLO 4 apply logical and quantitative reasoning to re-formulate both real life and scientific problems in				
Pre-requisites and Co-requisites and Impermissible combinations)	NIL (This cours	se is compulsory	, and to interpret their solutions for all students taking a Science major o on. Students should take this course in th		ience, except those	
Offer in 2020 - 2021	Y 1st		Offer in 2021 - 2022 : Y	Examination	Dec May	
Grade Descriptors (A+ to F)	В	strong analytical and situations. Carry out Demonstrate substa learning outcomes. S	gh mastery of extensive knowledge and skills requ d critical abilities and logical thinking, and ability to a computations carefully and correctly. Apply highly intial command of a broad range of knowledge and Show evidence of analytical and critical abilities and ar situations. Carry out computations mostly in	pply knowledge to a wide range of effective organizational and prese d skills required for attaining at leading to apply logical thinking, and ability to app	of familiar and unfamilia ntational skills. east most of the cours oly knowledge to familia	
	С	computational errors. Apply effective organizational and presentational skills. Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Commit a number of minor computational errors. Apply moderately effective organizational and presentational skills.				
	D	Show evidence of so knowledge to solve presentational skills.		nalytical and critical abilities. Sho errors. Apply limited or barely effe	ow limited ability to apply ective organizational and	
Course Type	Fail	of analytical and cr	no evidence of command of knowledge and skills itical abilities, logical and coherent thinking. Sho erious computational errors. Organization and prese	w very little or no ability to app	oly knowledge to solve	
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials	Self study			12 100	
Assessment Methods and Weighting	Methods	Sell study	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mappin	
	Assignments		coursework includes projects, class tests, and participation ir tutorials	50	CLO 1,2,3,4	
Required/recommended reading and online materials	Examinati TBC	on	2-hour examination	50	CLO 1,2,4	
Additional Course Information	following of do not take - Level 4 of (HKDSE)	indidates who have been admitted to Year 1 in 2020-21 (and thereafter) and have achieved any one of the lowing qualifications are exempted from taking SCNC1111. It is optional for them to take this course. Those who not take this course should take a 6-credit disciplinary elective course of the science major in lieu. evel 4 or above in Mathematics Extended Part Module 1 or 2 in the Hong Kong Diploma of Secondary Education				

(GCEAL)
- Mathematics qualification in Gao Kao will be considered on a case-by-case basis

		entals of modern science (6 credits)		Academic Yea				
Offering Department	Faculty			Quota				
Course Co-ordinator		Pun, Physics <i>(jcspun@hku.hk)</i>						
Teachers Involved		Leung,Faculty of Science)						
		u-Yeung,Chemistry)						
		Pun, Physics)						
		aitan-Espitia,Biological Sciences)						
	,	ton,Biological Sciences)						
0		ee,Earth Sciences)	-:		i This			
Course Objectives		se aims to provide students an overview of the dopts an integrated approach and encompasses						
		and focuses on the general principles and unifyi						
		the diverse phenomena and objects in the natura	•		•			
		developments and the modern frontiers, and the						
		iced and highlighted.						
Course Contents		sal principles and unifying concepts of science						
& Topics		mental structure of matter						
	- Structure	e of matter						
		ntum world						
		ary particles and standard model						
		and molecules						
		and atoms: The periodic table						
		al bonds and chemical reactions						
		nt molecules: water, carbon, molecular cluster ence and nanotechnology						
	(4) DNA/G							
	- Molecule							
		cs and DNA; Genetics and inheritance						
		and systems						
		ism and environment						
	- The origi	in and evolution of life						
	- Ecology	and environment						
	(7) Earth a	and Beyond						
		rth, Earth's atmosphere and hydrosphere						
		notion in space						
	- Planets, the Sun, and the solar system							
	- Cosmolo	U,						
Course Learning		ssful completion of this course, students should be						
Outcomes				CLO 1 acquire an understanding of the historical development of modern science, the essence and spirit of				
	scientific inquiry methods, and the role of science in the advancement of civilization over time							
	CL O 2				time			
		nderstand and be familiar with the fundamental sci	entific principles and	concepts				
	CLO 3 ap	nderstand and be familiar with the fundamental sci opreciate the diversity of different scientific discipl	entific principles and	concepts				
	CLO 3 ap	nderstand and be familiar with the fundamental sci opreciate the diversity of different scientific disciplerspectives on scientific issues	entific principles and ines and develop m	concepts ultidisciplinary a				
	CLO 3 appe	nderstand and be familiar with the fundamental sci opreciate the diversity of different scientific disciplerspectives on scientific issues itically and creatively appraise received ideas and	entific principles and ines and develop m established knowled	l concepts ultidisciplinary a dge	nd interdisciplinary			
	CLO 3 ap pe CLO 4 cr CLO 5 de	nderstand and be familiar with the fundamental sci opreciate the diversity of different scientific discipler erspectives on scientific issues itically and creatively appraise received ideas and evelop curiosity in science and an appreciation of	entific principles and ines and develop m established knowled	l concepts ultidisciplinary a dge	nd interdisciplinary			
Pre-requisites	CLO 3 appe CLO 4 cri CLO 5 de	nderstand and be familiar with the fundamental sci opreciate the diversity of different scientific disciplerspectives on scientific issues itically and creatively appraise received ideas and	entific principles and ines and develop m established knowled	l concepts ultidisciplinary a dge	nd interdisciplinary			
-	CLO 3 appe CLO 4 cri CLO 5 de a	nderstand and be familiar with the fundamental sci opreciate the diversity of different scientific discipler erspectives on scientific issues itically and creatively appraise received ideas and evelop curiosity in science and an appreciation of form of life-long learning	entific principles and ines and develop m established knowled sciences as related	l concepts ultidisciplinary a dge to different Scie	nd interdisciplinary			
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	Examination		50	CLO 1,2,3,4,5		
	Presentation	project presentation	20	CLO 1,2,3,4,5		
	Test		10	CLO 1,2,3,4,5		
Required/recommended	Textbook: Sciences: An Integrated	Approach by Trefil & Hazen 7th Ed	lition (2013, Wiley)			
reading and	References: Integrated Science by Tillery, Enger, & Ross 5th Edition (2011, McGrawHill)					
online materials	Biology: Concepts and Connections by Campbell, Mitchell, & Reece 2nd Edition (1999, Benjamin/Cummings)					
	Chemistry: An Atoms First Approach	ch by Zumdahl & Zumdahl (2012 C	engage)			

		history of our planeting that has ever hap	: a scientific perspective on pened (6 credits)	Academic Year	2020
Offering Department	Faculty			Quota	50
Course Co-ordinator		Cheung, Faculty (willmy	:@hku.hk)		
Teachers Involved		u,Physics)			
		Cheung, Faculty of Scien	nce)		
	(Prof Q A	Parker,Physics)			
Course Objectives	substance course air (1) discus establishe (2) develo (3) develo policies in	es, through the evolution on to: ss the process of sciented; p students' understanding p students' understanding	planet: from the Big Bang of the University of various species on Earth, to the established discovery, and how our current border of the multi-disciplinary nature of sciencing of the importance of science and technique of the future problems of our planet;	lishment of modern hu ody of knowledge ab e;	uman society, th
Course Contents	Part I: Fro	m the Cosmos to the Ato	m		
& Topics	know it; Topics inc equilibriun Part II: Fro Main them	clude: Big bang, nucleosy n of our planet Earth. om the Atom to Life ne: How we understand th	practions between the building blocks of representations, cooling of the properties of the transition from non-living matter to the ion, natural selection and tree of life.	e universe, star forma	ition, and therma
	Part III: From Life to Mind to Society Main theme: How our modern civilised society emerges through the development of intelligence and accumulation of knowledge; how science, technology, human society and environment influence one another; Topics include: Neural network and the emergence of intelligence, historical development of modern science, the role of science in human civilisation and the contemporary world. Part IV: Looking into the Future Main theme: Outlook on the future of science, technology, human society and environment; key challenges to be				
Course Learning Outcomes	faced by humankind that could be addressed by science and technology; Topics include: Students will attend one of several parallel modules on topics that suit their interests, such asnano technology, climate change, energy crisis, bioethics and artificial intelligence. On successful completion of this course, students should be able to: CLO 1 appreciate and elaborate on the significance of major events in the development and formation of our				
	Universe, our Earth system and our modern society CLO 2 explain, with some level of depth and details, how a number of major theories allows us to understand the workings of the world				
	CLO 3 understand how different science disciplines fit and emerge from one another as a collective effort of the humankind to understand Nature				
	CLO 4 critically assess the mutual influence between science and human society, the role of science in our society as well as the making of science policy in our local region CLO 5 evaluate some of the major challenges faced by humankind, and discuss solutions from a multi-disciplinary				
	perspective CLO 6 test claims and engage in historical analysis based on theories and practices from multiple disciplines				
Pre-requisites (and Co-requisites	Level 3 or above in at least one science subject at the pre-university level (HKDSE Physics, Chemistry, Biolo Combined/Integrated Science or equivalent) This course is not offered to students in the 6901 BSc or 6119 BEd&BSc programmes.				
and Impermissible	N. Offer in 2024 2022 V				
and Impermissible combinations)	N Offe	er in 2021 - 2022 : Y		Examination	
and Impermissible combinations) Offer in 2020 - 2021	N Offe	Demonstrate thorough maste strong analytical and critical a	ry of extensive knowledge and skills required for a billities and logical thinking, and ability to apply knowledge and the state of the	ttaining all the course learr wledge to a wide range of f	amiliar and unfamilia
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors		Demonstrate thorough maste strong analytical and critical a situations. Carry out computa Demonstrate substantial com learning outcomes. Show evic and some unfamiliar situation	bilities and logical thinking, and ability to apply kno- tions carefully and correctly. Apply highly effective c mand of a broad range of knowledge and skills re- dence of analytical and critical abilities and logical th	ttaining all the course learn wledge to a wide range of foor organizational and presenta equired for attaining at leas ninking, and ability to apply	amiliar and unfamilia tional skills. st most of the cours knowledge to familia
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A	Demonstrate thorough maste strong analytical and critical a situations. Carry out computa Demonstrate substantial com learning outcomes. Show evid and some unfamiliar situatic computational errors. Apply e Demonstrate general but indoutcomes. Show evidence of	bilities and logical thinking, and ability to apply kno- tions carefully and correctly. Apply highly effective c mand of a broad range of knowledge and skills re dence of analytical and critical abilities and logical th	ttaining all the course learn whedge to a wide range of forganizational and presental equired for attaining at leas inking, and ability to apply all and correct way, but of ired for attaining most of hinking, and ability to apply and and ability to apply to apply and ability to apply the course of the course	amiliar and unfamilia tional skills. st most of the cours knowledge to familia commit some minor the course learning y knowledge to mos
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A B C	Demonstrate thorough maste strong analytical and critical a situations. Carry out computa Demonstrate substantial com learning outcomes. Show evid and some unfamiliar situatic computational errors. Apply e Demonstrate general but incoutcomes. Show evidence of familiar situations. Commit a skills. Demonstrate partial but limite Show evidence of some cohe knowledge to solve problems presentational skills.	bilities and logical thinking, and ability to apply kno- tions carefully and correctly. Apply highly effective c immand of a broad range of knowledge and skills re- dence of analytical and critical abilities and logical the ons. Carry out computations mostly in a carefi- ffective organizational and presentational skills. complete command of knowledge and skills requi- f some analytical and critical abilities and logical the number of minor computational errors. Apply model and command of knowledge and skills required for a greent and logical thinking, but with limited analytical commit some substantial computational errors. Ap	ttaining all the course learn whedge to a wide range of forganizational and presenta equired for attaining at leas ninking, and ability to apply all and correct way, but or irred for attaining most of hinking, and ability to apply rately effective organization attaining some of the cours and critical abilities. Show I opply limited or barely effective	amiliar and unfamilia tional skills. It most of the course knowledge to familia commit some minor the course learning y knowledge to most all and presentational e learning outcomes limited ability to appli- we organizational and
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A B C	Demonstrate thorough maste strong analytical and critical a situations. Carry out computa Demonstrate substantial com learning outcomes. Show evidence of some unfamiliar situatic computational errors. Apply e Demonstrate general but incoutcomes. Show evidence of familiar situations. Commit a skills. Demonstrate partial but limite Show evidence of some cohe knowledge to solve problems presentational skills. Demonstrate little or no evide of analytical and critical abil	bilities and logical thinking, and ability to apply kno- tions carefully and correctly. Apply highly effective c mand of a broad range of knowledge and skills re- dence of analytical and critical abilities and logical the ons. Carry out computations mostly in a careful fective organizational and presentational skills. complete command of knowledge and skills required is some analytical and critical abilities and logical the number of minor computational errors. Apply model and command of knowledge and skills required for a corrent and logical thinking, but with limited analytical	ttaining all the course learn whedge to a wide range of forganizational and presenta equired for attaining at least inking, and ability to apply all and correct way, but covered for attaining most of hinking, and ability to apply rately effective organization attaining some of the course and critical abilities. Show loply limited or barely effective for attaining the course learn title or no ability to apply	amiliar and unfamiliational skills. st most of the cours knowledge to familia commit some mino the course learning y knowledge to mos ial and presentationa e learning outcomes limited ability to appl ve organizational an rming outcomes. Lac knowledge to solve
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	A B C D	Demonstrate thorough maste strong analytical and critical a situations. Carry out computa Demonstrate substantial com learning outcomes. Show evidence of some unfamiliar situatic computational errors. Apply e Demonstrate general but incoutcomes. Show evidence of familiar situations. Commit a skills. Demonstrate partial but limite Show evidence of some cohe knowledge to solve problems presentational skills. Demonstrate little or no evide of analytical and critical abil	ubilities and logical thinking, and ability to apply kno- tions carefully and correctly. Apply highly effective command of a broad range of knowledge and skills re- dence of analytical and critical abilities and logical thous. Carry out computations mostly in a carefifective organizational and presentational skills. Complete command of knowledge and skills required some analytical and critical abilities and logical thumber of minor computational errors. Apply modes and command of knowledge and skills required for a cerent and logical thinking, but with limited analytical commits some substantial computational errors. Apply modes the command of knowledge and skills required for a cerent and logical thinking, but with limited analytical commits some substantial computational errors. Apply modes the command of knowledge and skills required littles, logical and coherent thinking. Show very littles, logical and coherent thinking. Show very littles, logical and coherent thinking.	ttaining all the course learn whedge to a wide range of forganizational and presenta equired for attaining at least inking, and ability to apply all and correct way, but covered for attaining most of hinking, and ability to apply rately effective organization attaining some of the course and critical abilities. Show loply limited or barely effective for attaining the course learn title or no ability to apply	amiliar and unfamiliational skills. st most of the cours knowledge to familia commit some mino the course learning y knowledge to mos ial and presentationa e learning outcomes limited ability to appl ve organizational an rming outcomes. Lac knowledge to solve
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A B C D	Demonstrate thorough maste strong analytical and critical a situations. Carry out computa Demonstrate substantial com learning outcomes. Show evid and some unfamiliar situatic computational errors. Apply e Demonstrate general but incoutcomes. Show evidence of familiar situations. Commit a skills. Demonstrate partial but limite Show evidence of some cohe knowledge to solve problems presentational skills. Demonstrate little or no evide of analytical and critical abil problems. Commit serious coased course	ubilities and logical thinking, and ability to apply kno- tions carefully and correctly. Apply highly effective command of a broad range of knowledge and skills re- dence of analytical and critical abilities and logical thous. Carry out computations mostly in a carefifective organizational and presentational skills. Complete command of knowledge and skills required some analytical and critical abilities and logical thumber of minor computational errors. Apply modes and command of knowledge and skills required for a cerent and logical thinking, but with limited analytical commits some substantial computational errors. Apply modes the command of knowledge and skills required for a cerent and logical thinking, but with limited analytical commits some substantial computational errors. Apply modes the command of knowledge and skills required littles, logical and coherent thinking. Show very littles, logical and coherent thinking. Show very littles, logical and coherent thinking.	ttaining all the course learn whedge to a wide range of forganizational and presenta equired for attaining at least inking, and ability to apply all and correct way, but covered for attaining most of hinking, and ability to apply rately effective organization attaining some of the course and critical abilities. Show loply limited or barely effective for attaining the course learn title or no ability to apply	amiliar and unfamiliational skills. st most of the cours knowledge to familia commit some mino the course learning y knowledge to mos ial and presentationa e learning outcomes limited ability to appl ve organizational an rming outcomes. Lac knowledge to solve

	Tutorials			12
	Reading / Self study			100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments	About 3 reading assignments will be given. Students will then be assessed in various forms such as drawing mind maps, short quizzes or reflective journals.	40	CLO 1,2,3,4,5,6
	Presentation	Tutorial participation	10	CLO 1,2,3,4,5,6
	Project reports		30	CLO 1,3,4,5,6
	Test		20	CLO 1,2,3,4,6
Required/recommended reading and online materials	Charles Darwin: The Origin of Speric R. Kandel: In Search of Mer Fred Spier: Big history and the fundamental David Christian, Cynthia Brown Humanities/Social Sciences/Lan	nory: The Emergence of a New Science of a New Science of turne of humanity (Wiley-Blackwell) and Craig Benjamin: Big History: Betwe	of Mind (W. W. Norton &	Company)

d production (6 credits)	Academic Year	2020			
	Quota	32			
Biological Sciences (elnezami@hku.hk)					
BC Faculty of Land and Food Systems) Biological Sciences)					
This course is designed to provide students with the opportunity to experience the inner-workings of a sustainable campus farming operation, and to make connections between the ecosystems that nourish the thriving, urba communities surrounding the farm. Students will participate in plenary sessions with course instructors and guest lecturers from the UBC Faculty of Land and Food Systems, in guided group discussions, field trips on and o campus, and in a variety of seasonal, hands-on farming activities.					
The MacMillan building, home of the UBC Faculty of Land and Food Systems, will be the site of the plena sessions, guest speaker lectures, and morning group discussion sessions. The south campus farm in UBC is the site of the majority of farming activities, including afternoon group discussions, harvest Fridays and mark Saturdays. Students will have a chance to explore the UBC campus sustainability hot-spots, including the LF orchard garden, the world-class CIRS green building, Place Vanier, home of an innovative campus chef, Ster Golieb, and the wiggle worm project in the Student Union Building/SUB. Students will also venture off-campus two the Vancouver Farmers' Market and to Granville Island Public Market to provide a comparative view marketing systems and the regionally grounded food system context. The main approach to learning with this course is student-centered learning and hands-on experience. To me course learning objectives, students are expected to attend and participate in all sessions, to contribute to ground discussions and the group oral presentation, and to complete a series of reflective journals on each of the formain course themes-soils, biodiversity, seeds, marketing. On successful completion of this course, students should be able to: CLO 1 connect underlying agroecosystem concepts and soil science fundamentals with principles and practices.					
of sustainable farming CLO 2 observe and compare multiple models of agricultural food production in an urban and campus farm s CLO 3 identify multiple strategies for creating on-farm biodiversity CLO 4 demonstrate a basic understanding of composting fundamentals CLO 5 demonstrate the ability to perform a select set of basic crop maintenance, harvest, washing, and p techniques in a sustainable campus farm setting CLO 6 demonstrate best practices with post-harvest handling and food safety protocols Students are expected to have passed at least 30 credits of level 1 and/or level 2 science courses. Stude					
n interview in order to be enrolled in the course.					
- 2022 : Y	Examination				
standing of the basics from sustainable farming to marketing strategies used by sustainable farming operations. form crop maintenance, harvest, washing, and packing in a sustainable campus farm setting. Ability to demonstrate ased skills for performance of fieldwork, and distinct performance in different assessment components. Ability to he lessons learned during the course and articulate individual learning objectives for further studies in agriculture, nan health.					
Clear understanding of the basics from sustainable farming to marketing strategies used by sustainable farming operations. Ability to perform crop maintenance, harvest, washing, and packing in a sustainable campus farm setting. Ability to demonstrate solid team-based skills for performance of fieldwork, and distinct performance in different assessment components.					
Understanding of the basics from sustainable farming to marketing strategies used by sustainable farming operations. Ability the perform crop maintenance, harvest, washing, and packing in a sustainable campus farm setting. Satisfactory demonstration of team-based skills for performance of fieldwork, and satisfactory performance in different assessment components.					
Nowing some of the basics of sustainable farming. Active participation in team-based fieldwork, and satisfactory perform different assessment components.					
by the basics of sustainable farming as demonstrated by unsatisf	actory periormance in assigning	one and/or neiuwork.			
Deteile		No of Harry			
Details		No. of Hours			
		20			
Croup discussion / Project		50			
		10			
		50			
		30 Assessmen			
ıd	Group discussion / Project Idy End of trip report Details	End of trip report			

and Weighting			course grade (%)	Methods to CLO Mapping
	Assignments	To be announced by UBC Faculty of Land and Food Systems	40	CLO 1,2,4,5
	Report	Students will divided into groups of 3-4. Each group will submit a 7-10 pages report (not including the references). Please refer to Remarks for format requirements.	60	CLO 3,5,6
Required/recommended reading and online materials	UBC Faculty of Land and Food Sy	stems will give reading materials to stud	dents.	
Course Website	http://www.scifac.hku.hk/news/bsc	c/ubc-summer-course		
Additional Course Information	(prices to be announced). This course will be offered subject Enrolment of this course is not manually by the Faculty after appr This course is taught by staff in Ufferent Remarks: Students will divided into groups of Please use Times New Roman (summarize the group HACCP plar food safety issues. The marking of	over their own travel costs and course to a minimum enrollment number and a conducted via the online course sele oval has been obtained from the course 3C and the end of trip report is graded b of 3-4. Each group will submit a 7-10 par (12 points), single space and 2 cm man, issues, problems and approaches and criteria are the scientific quality and cleatenting 12-15 minutes on the topic of the	availability of teachers. ction system. Students coordinator. y Dr H S El-Nezami. ges report (not including argins from all sides. The d suggestions to address ar identification of the issu	will be enrolled the references). he report should any farm related

SCNC2122	Marine li credits)	fe science: a North East Pacific perspective (6	Academic Year	2020		
Offering Department	Faculty		Quota	32		
Course Co-ordinator	Dr T Venga	atesen, Biological Sciences (rajan@hku.hk)				
Teachers Involved	(Prof G A V (Prof R S S (Prof S Kw	gatesen,Biological Sciences) Williams,Biological Sciences) S Wu,Biological Sciences) ok,Earth Sciences)				
Course Objectives	biology thr will learn interactions to human.	Marine Life Science is an integrated study of how the oceans influence large and small scale patterns of marine biology through biophysical interactions. By studying the temperate cold waters of the NE Pacific Ocean, students will learn marine habitats as habitable planet, to appreciate the dynamics of marine biodiversity, the complex interactions between the physical and biological components, fishery, and the services the coastal oceans provide to human. This course will provide an excellent opportunity for students to experience the diversity of marine life on the other side of the Pacific.				
Course Contents & Topics	abundance The cours change mi series of fi opportunity northern ty the Marina intertidal z Marine bio will be exp teachers a	rom both HKU and UBC teachers will introduce 'marine life and distribution of species, productivity, coastal pollution, fis e will also introduce the commercial aspects of marine life, itigation through management of coastal ecosystems. All the eld observations, presentations from guest lecturers and grouy to touch and learn about Canada's wonderful marine life di ancouver Fish Hatchery. Students will be learning Canada's coal (Reed point marina) and the Sea-grass habitat. There will also one, exposed and protected coastal habitats, sandy beaches diversity survey techniques and methods of studying marine life bosed to a different learning environment involving not only Hond students, bringing diverse range of expertise, cultures, and Ocean to focus on the diversity, dynamic interactions and three	sheries, aquaculture and i.e. eel-grass, aquacul ise lectures will be disc p discussions. There wi iversity in the Vancouver acastal plankton biodivers so be several opportunit and estuaries in the Verein the field will be empt KU teachers and studer learning opportunities fi	I climate change, ture and climate ussed through a ll be an excellenter Aquarium, and itty through visinglies to explore the ancouver Island, hasized. Students but also UBC		
Course Learning		sful completion of this course, students should be able to:				
Outcomes		derstand the basics of marine life science and the marine habita	able planet			
	CLO 2 exp wa thr CLO 3 des CLO 4 dis	plain the major types, causes, and effects of marine threat irming and ocean acidification, and invasive species, as well eats for marine communities and ecosystem services scribe the difference between coastal marine biodiversity and history the reasons why marine biodiversity and ecosystem services. North Pacific coastal ecosystems	s such as pollution, ov as describe the conseq arbors in Hong Kong and	uences of these		
Pre-requisites		are expected to have passed at least 30 credits of level 1 and	for level 2 science source	oc Studente wil		
(and Co-requisites and Impermissible combinations)		to pass an interview in order to be enrolled in the course.	701 level 2 science cours	ses. Students wil		
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : Y	Examination			
Grade Descriptors (A+ to F)	A	Demonstrate through knowledge in basics of marine science and clearly ur tropical Hong Kong is different from the North Pacific coastal areas. Ability their particular environments. Showing strong abilities, and logical thinking, w why the diversity of marine life and their habitats are so important to human s threats such as climate change, pollution and habitat change will affect marine	to explain how marine organis ith evidence of original thought ociety. Independent critique or	sms have adapted to t, to examine reasons n how human induced		
	В	Clear understanding of the basics of marine science. Ability to explain how environments. Knowing the common views on the reasons why the diversity human society. Knowing the common views on how human induced three change will affect marine life, its diversity and their ecosystem services.	marine organisms have adapt of marine life and their habitat	ted to their particular s are so important to		
	С	Demonstrate partial and limited command of knowledge and understanding coastal ecosystem services. Develop little ability to explain how marine organ Knowing the common views on the reasons why the diversity of marine life a Knowing the common views on how human induced threats such as clima marine life, its diversity and their ecosystem services.	isms have adapted to their par nd their habitats are so import	rticular environments. ant to human society.		
	D	Knowing some of the basics of marine science. Developing ability to expl	ain how marine organisms h	ave adapted to their		

		particular environment	S.			
	Fail	Fail to follow the basic	s of marine science and/or how marine organisms	s have adapted to their particula	r environments.	
Course Type	Field ca	mps				
Course Teaching & Learning Activities	Activities		Details	Details		
	Lectures		10 sessions x 2.5 hours	10 sessions x 2.5 hours		
	Field wo	ork	Field observation and work: about	t 5 to 6 field study	36	
	Presentation		Group discussion / Project: resentation	Group discussion / Project: 1 group project with presentation		
	Reading	g / Self study			70	
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignn	nents	Group project work (30-mins presentation)	25	CLO 2	
	Report		2-hour written examination	50	CLO 1,4	
	Test		Field observation (group activities & reports)	25	CLO 3,4	
Required/recommended reading and online materials	Referen	ce reading materials v	will be put on Moodle.			
Course Website	http://wv	vw.scifac.hku.hk/news	s/bsc/ubc-summer-course			
Additional Course Information	(prices to This cou Enrolme	o be announced). Irse will be offered su Int of this course is	to cover their own travel costs and control bject to a minimum enrollment number a not conducted via the online course approval has been obtained from the course	and availability of teachers selection system. Stude	S.	

SCNC3111	Frontier	s of science hor	ours seminar course (6 credits)	Academic Year	2020		
Offering Department	Faculty		, ,	Quota	120		
Course Co-ordinator	Dr R K W	Lui, Faculty (lui2012	2 @hku.hk)				
Teachers Involved	(Dr C Zheng,Biological Sciences) (Dr E K M Leung,Faculty of Science) (Dr R K W Lui,Faculty of Science) (Dr W M Y Cheung,Faculty of Science)						
Course Objectives	To introduce the research being done by our Faculty's professors To broaden and enrich students' scientific knowledge in and outside of their chosen major To foster intellectual discussions between our research professors and students To observe how research is done and note the thinking processes and paths that lead to scientific discoveries To enhance students' awareness of the importance of science to solve some of the problems facing the society To collaborate with and learn from peers from different academic backgrounds in a scientific setting To develop essential written and spoken communication skills To serve as a potential mentor-mentee matching platform for faculty members and students To develop an awareness of research ethics						
Course Contents & Topics	latest resorders, a for condu	Professors from different departments will be featured in the honours seminar course, and they will discuss thei latest research with students. The topics will span the areas of Biological Sciences, Chemistry, Earth Sciences Physics, as well as Mathematics/Statistics & Actuarial science. In addition, the following topics to prepare student for conducting and communicating research will also be introduced: Introduction to Different Search Engines fo Scientific Journals and/or Decoding a Scientific Paper and/or Effective Communication for Scientists (Writing, Ora					
Course Learning			his course, students should be able to:				
Outcomes		•	in an informed manner the fields of research	ch of some of our resear	ch professors		
			rs with different scientific training solve thei				
			n skills to identify and develop a research to	•			
				opic			
			cientific writing and presentation skills				
	CLO 5 demonstrate interpersonal skills in collaborating with their peers in a scientific setting						
	CLO 6 d	evise a research pro	posal and evaluate their peers' works				
Pre-requisites (and Co-requisites and Impermissible combinations)			12 and a level 2 science course. will participate in ORF/SRF must take this o	course.			
Offer in 2020 - 2021	Y 1st	sem Offer in 2021	- 2022 : Y	Examination	No Exam		
Grade Descriptors (A+ to F)	A	151 5-111 6-111 11 2-21 2-21 11					
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to mo familiar situations. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-b	ased course					
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures	-	=		36		
	Tutorials				12		
		/ Colf atude			100		
		/ Self study					
Assessment Methods	Methods		Details	Weighting in final	Assessment		

and Weighting			course grade (%)	Methods to CLO Mapping
	Assignments	A series of writing and reflection assignments will be given	40	CLO 1,2,4
	Presentation	Students will give a 30-minute group presentation during the last week of the instruction	40	CLO 3,4,5,6
	Project reports	In-class formative assessment: activities for students to work in groups	20	CLO 1,2,4,5
Required/recommended reading and online materials	TBC (suggested by the profess	ors)		

STAT1005		al skills for undergraduates: foundations of data (6 credits)	a Academic Yea	2020		
Offering Department		& Actuarial Science	Quota	210		
Course Co-ordinator	Prof J J F	Yao, Statistics & Actuarial Science (jeffyao@hku.hk)				
eachers Involved		Lau,Statistics & Actuarial Science)				
	- '	Yao,Statistics & Actuarial Science)				
Course Objectives	teaching i pre-requis	se introduces basic concepts and methodology of data s is designed at a level appropriate for all undergraduate s sites. will engage in a full data work-flow including collaborativ of data science topics, from initial investigation and data a	tudents with various backgr e data science projects. Th	ounds and withou ney will study a fu		
	Specificall the purpos prediction	ly, the course provides exposure to different data types an se of transforming them to a format suitable for analysis. and inference. Case studies involving less-manicured datical abilities of the students.	d sources, and the process It introduces elementary no	of data curation fo		
Course Contents & Topics	- General * Overvi	introduction to data science ew with selected case studies. General discussion on or of tools for their analysis.	igins and forms of data, as	sociated questions		
	* Data s cleaning/e Environme distribution - Data ana * Comple * Statistic	ements on programming; cs (1): model for randomness, random variables, distributi ics (2): independent sample, estimation of mean and va	ing language and Integra EDA); Summaries, aggreg ons, histograms, correlation	ted Development ation, smoothing, s.		
		cs (3): regression models, forecasting, simple time series,	method of classification.			
Course Learning		ssful completion of this course, students should be able to:				
Outcomes		xplore and wrangle over data; summarize and visualize da				
		ormulae problems and bring elementary concepts in estim		nce to bear		
		Vrite basic functions and simple data analysis codes using				
Pre-requisites		udents who have passed in STAT1015, or already enrolled	' '	u. 0		
and Co-requisites and Impermissible combinations)		ASc(AppliedAl) and BASc(FinTech) students.	m the course, and			
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2022 : Y	Examination	No Exam		
	A 130	Demonstrate thorough mastery at an advanced level of extensive k				
Grade Descriptors (A+ to F)		learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.				
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning				
	С	and some unfamiliar situations. Apply effective organizational and pres Demonstrate general but incomplete command of knowledge and s	d logical thinking, and ability to app sentational skills. skills required for attaining most	ly knowledge to familia of the course learning		
	С	and some unfamiliar situations. Apply effective organizational and pres Demonstrate general but incomplete command of knowledge and s outcomes. Show evidence of some analytical and critical abilities and familiar situations. Apply moderately effective organizational and prese Demonstrate partial but limited command of knowledge and skills req Show evidence of some coherent and logical thinking, but with limited	d logical thinking, and ability to appentational skills. skills required for attaining most of logical thinking, and ability to apputational skills. uired for attaining some of the could analytical and critical abilities. Sho	ly knowledge to familia of the course learning oply knowledge to mos urse learning outcomes		
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STAT1015	Introduction to data science (6 credits)	Academic Year	2020
Offering Department	Statistics & Actuarial Science	Quota	40
Course Co-ordinator	Prof J J F Yao, Statistics & Actuarial Science (jeffyao@hku.hk)		
Teachers Involved	(Dr A S M Lau, Statistics & Actuarial Science) (Prof J J F Yao, Statistics & Actuarial Science)		
Course Objectives	The course introduces basic concepts and methodology of data science to juteaching is designed at a level appropriate for all undergraduate students with pre-requisites.		

	Studente	will appears in a full de	ata work flow including collaborative	data colongo projecto. T	boy will study a full	
		0 0	ata work-flow including collaborative from initial investigation and data acq	. ,		
	the purpo prediction	se of transforming then	exposure to different data types and n to a format suitable for analysis. It tudies involving less-manicured data ents.	introduces elementary n	otions in estimation,	
Course Contents & Topics	* Overvi	introduction to data scie iew with selected case s of tools for their analys	studies. General discussion on original	ins and forms of data, a	ssociated questions	
	* Data s cleaning/e Environm	extraction; Quick intro	n and its impact on visualization, moduction to high level programming c); Exploratory Data Analysis (ED	g language and Integr	ated Development	
	* Statisti * Statisti with p-val	ements on programming ics (1): model for randolics (2): independent salue.	g; mness, random variables, distribution imples, estimation of mean and varia lls, forecasting, simple time series, ma	ance, confidence interva		
	- Worksho	ops on advanced topics	of data science			
Course Learning	On succe	ssful completion of this	course, students should be able to:			
Outcomes			er data; summarize and visualize data			
			bring elementary concepts in estimate			
			d simple data analysis codes using st		ware	
			alysis project using advanced method			
Pre-requisites (and Co-requisites and Impermissible			d in STAT1005, or already enrolled in c(AppliedAI) and BASc(FinTech) stud			
combinations) Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2	022 · V	Evamination	No Evam	
Grade Descriptors	A ISI		Stery at an advanced level of extensive kno	Examination where and skills required for	No Exam	
(A+ to F)		learning outcomes. Show s to apply knowledge to a v presentational skills.	strong analytical and critical abilities and logica vide range of complex, familiar and unfamilia	al thinking, with evidence of or ar situations. Apply highly effe	iginal thought, and ability ective organizational and	
	В	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the cour learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to family and some unfamiliar situations. Apply effective organizational and presentational skills.				
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type		vith laboratory componer				
Course Teaching & Learning Activities	Activitie		Details		No. of Hours	
∝ Learning Activities	Lectures				36	
	Project w Tutorials				40 12	
		/ Self study			40	
	Assessm				20	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents	Written / programming; class discussions; quizzes	50	CLO 1,2,3	
	Presenta	ition	, 1	10	CLO 1,2,3,4	
	Project re		In small groups of 4 students	40	CLO 1,2,3,4	
Course Website		odle.hku.hk	· · ·			

STAT1600	Statistics: ideas and concepts (6 credits)	Academic Year	2020			
Offering Department	Statistics & Actuarial Science	Quota				
Course Co-ordinator	Dr C W Kwan, Statistics & Actuarial Science (cwkwan@hku.hk)					
Teachers Involved	(Dr C W Kwan, Statistics & Actuarial Science) (Dr Y K Chung, Statistics & Actuarial Science)					
Course Objectives	The course aims at providing a broad overview of statistics for students who Management. It focuses on the roles of statistics as a scientific tool with a disciplines, and as a science of reasoning which has revolutionized modern panoramic foundation for a formal study of statistics at the university level.	applications to a w	vide spectrum of			
Course Contents & Topics	- Data collection: observational studies versus designed experiments - Data presentation: tables; graphs; frequency distributions; correlations; trends - Probability: randomness; probability models; distributions; measures of central tendency and dispersion - Inference: estimation; tests of significance and hypotheses; confidence intervals; regression; prediction - Further issues: controversies; misuse of statistics; ethics.					
Course Learning	On successful completion of this course, students should be able to:					

Outcomes	CLO 1 understand the role of statistics as a tool for scientific reasoning						
		esent data in a useful a		-9			
	CLO 3 acquire basic concepts and perspectives of statistical modelling and inference						
			and bad statistical practices	J			
			tatistics or Risk Management with a	well-established concept	ual foundation		
Pre-requisites			in any of the following courses: STA	•			
(and Co-requisites and Impermissible combinations)		Not for stadents who have passed in any or the following socioses. STAT 1002, STAT 1000, STAT 10002.					
Offer in 2020 - 2021	Y 1st	sem 2nd sem Offer	in 2021 - 2022 : Y	Examination	Dec May		
Grade Descriptors (A+ to F)	A	learning outcomes. Show st	tery at an advanced level of extensive known rong analytical and critical abilities and logical ide range of complex, familiar and unfamilia	al thinking, with evidence of ori	ginal thought, and ability		
	В	learning outcomes. Show ev	mmand of a broad range of knowledge and idence of analytical and critical abilities and long. Apply effective organizational and present	ogical thinking, and ability to ap			
	С						
	D						
	Fail						
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	3	Details	No. of Hours			
& Learning Activities	Lectures			36			
	Tutorials				12		
	Reading /	Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	Coursework (assignments, class test(s) and project(s))	60	CLO 1,2,3,4,5		
	Examinat	ion	One 2-hour written examination	40	CLO 1,2,3,4,5		
Required/recommended	Utts, J.M.	(2014). Seeing Through	Statistics (4th edition). Cengage Lea	arning.			
reading and			2). Statistics (International edition, 4				
online materials			d Zappe, C. J. (2009). Data Analysi	s and Decision Making v	vith Microsoft Excel		
	Cengage I Moore, D.		6). Statistics: Concepts and Controve	ersies. Freeman: New Yo	rk.		
Course Website	http://moo	dle.hku.hk	· · · · · ·				

STAT1601	Elementary statistical methods (6 credits)	Academic Year	2020			
Offering Department	Statistics & Actuarial Science	Quota				
Course Co-ordinator	TBC, Statistics & Actuarial Science ()					
Teachers Involved						
Course Objectives	Research findings are usually supported by data. Data collected in an estructions involving variability and uncertainty. They are used to estimatest the acceptability of a certain new hypothesis. Valid methods of a successful investigation. The course aims to present the fundament researchers. Microsoft Excel might be used to carry out some states sophisticated technical mathematics.	ate the true value of a cert nalysing the data are thus als of statistical methods	ain quantity or to essential to any widely used by			
Course Contents & Topics	The course will introduce and study the following topics: Presentation of data, Measures of Central Tendency, Measures of Variability and Uncertainty, Basic Probal Laws, Common Probability Distributions such as Uniform, Binomial, Poisson, Hyper-geometric, Geometric Normal distributions, Random Sampling, Distribution of the Mean, Normal Sampling Theorem, Point Estimal Confidence Intervals, Sample Size Determination, Hypothesis Testing, Inferences for Mean and Proportion, squared tests, Simple Regression and Correlation					
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 select and use appropriate statistical methods to analyze data					
	CLO 2 perform statistical analysis with calculator and Microsoft Excel					
	CLO 3 understand and apply basic concepts of probability					
	CLO 4 gain familiarity with the fundamental concepts of random variable	es				
	CLO 5 make inferences on a population based on sample data					
	CLO 6 determine the most appropriate statistical method to use for a gi	iven statistical problem				
	CLO of determine the most appropriate statistical method to use for a given statistical problem.					
	CLO 8 understand the basic principles of simple linear regression and correlation and their applications to practical problems					
Pre-requisites	Level 2 or above in HKDSE Mathematics or equivalent; and					
(and Co-requisites	Not for students with Level 2 or above in HKDSE Mathematics Extended	d Module 1 or 2; and				
and Impermissible combinations)	Not for students who have passed or already enrolled in any of the STAT2601, STAT1603, ECON1280	following courses: STAT2	901, STAT1602,			
Offer in 2020 - 2021	N Offer in 2021 - 2022 : N	Examination				
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowlearning outcomes. Show strong analytical and critical abilities and logical to apply knowledge to a wide range of complex, familiar and unfamiliar presentational skills.	thinking, with evidence of original situations. Apply highly effective	al thought, and ability e organizational and			
	B Demonstrate substantial command of a broad range of knowledge and sl learning outcomes. Show evidence of analytical and critical abilities and log and some unfamiliar situations. Apply effective organizational and presenta	ical thinking, and ability to apply				
	C Demonstrate general but incomplete command of knowledge and skills outcomes. Show evidence of some analytical and critical abilities and log					

	fan	niliar situations. Apply m	oderately effective organizational and prese	ntational skills.			
	Sh	monstrate partial but limited command of knowledge and skills required for attaining some of the course learning ow evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited abil owledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail De of	monstrate little or no evi analytical and critical a	dence of command of knowledge and skills ibilities, logical and coherent thinking. Sho d presentational skills are minimally effective	required for attaining the course ow very little or no ability to ap			
Course Type	Lecture-based	d course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading / Self study				100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3,4,5,6		
	Examination		One 2-hour written examination	75	CLO 1,2,3,4,5,6,7,8		
Required/recommended reading and online materials	Larson, R. & F Berk, K.N. & C	Chiu W. K.: Basic Statistics (Pearson (Asia), 2007) Larson, R. & Farber, B.: Elementary Statistics, Picturing the World (Prentice Hall, 2008, 4th ed.) Berk, K.N. & Carey, P.: Data Analysis with Microsoft EXCEL (Duxbury press, Update Office 2007) Freund, J. E. & Perles, B. M.: Statistics - A First Course (Prentice Hall, 2004, 8th ed.)					
Course Website	http://moodle.			,,,			
Additional Course Information	Calculator: CASIO fx-50FH (This model has SD-MODE, REG-MODE, nCr and Normal Probability Function which is very suitable for this course.)						

STAT1602	Busines	s statistics (6 c	redits)	Acader	nic Yea	r 2020	
Offering Department	Statistics	& Actuarial Science	•	Quota			
Course Co-ordinator	Dr R W L	Wong, Statistics &	Actuarial Science (rwong@hku.hk)				
Teachers Involved	(Dr R W L	Wong, Statistics &	Actuarial Science)				
Course Objectives	The discipline of statistics is concerned with situations involving uncertainty and variability. Variability greatly affects the interpretation of data. Thus statistics forms an important descriptive and analytical tool. This elementary course, which is taught without much technical mathematics, presents many standard situations of data analysis and interpretation with emphases on business examples. The statistical tests of these situations are presented. Microsoft Excel might be used to carry out some statistical analysis.						
Course Contents & Topics	Measures Binomial, Point Esti Means ar	The course will introduce and discuss the following topics: Presentation of Data, Measures of Central Tendency, Measures of Variability and Uncertainty, Elementary Probability Rules and Basic Probability Distributions such as Binomial, Normal, Poisson, Hyper-geometric and Geometric, Random Sampling, the Normal Sampling Theorem, Point Estimation, Confidence Intervals and Sample Size Determination, Hypothesis Testing involving Inferences for Means and Proportions as well as the Chi-square tests, Simple Regression and Correlation, Elementary Time Series and Index Numbers					
Course Learning	On succes	ssful completion of	this course, students should be able	to:			
Outcomes	CLO 1 ur	nderstand the meth	ods for describing sets of data				
	nı	ımerical summarie:	analysis with calculator and Micros s y basic concepts of probability	oft Excel, draw conc	usions	from data using	
	CLO 4 ga	ain familiarity with th	he fundamental concepts of random v	ariables			
		•	a population based on sample data				
	CLO 6 de	etermine the most a	appropriate statistical method to use for	or a given statistical pro	blem		
	CLO 7 gain familiarity with the fundamental concepts of statistical inference as they apply to a variet CLO 8 understand the basic principles of simple linear regression and correlation and their a practical problems in today's society						
	pr	actical problems in	today's society				
(and Co-requisites and Impermissible combinations)	Not for st STAT160 (This cour	udents who have 3, STAT2901 or EC se is available to s	passed or already enrolled in any o CON1280 tudents pursuing a major/minor in Bus	siness only).			
(and Co-requisites and Impermissible combinations)	Not for st STAT160 (This cour	udents who have 3, STAT2901 or EC se is available to s sem 2nd sem	passed or already enrolled in any o CON1280 tudents pursuing a major/minor in Bus Offer in 2021 - 2022 : Y	siness only).	ation	Dec May	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	Not for st STAT160 (This cour	udents who have 3, STAT2901 or EC se is available to s sem 2nd sem 0 Demonstrate thoroug learning outcomes. S to apply knowledge presentational skills. Demonstrate substar	passed or already enrolled in any ocon1280 tudents pursuing a major/minor in Bustoffer in 2021 - 2022: Y with mastery at an advanced level of extensive how strong analytical and critical abilities and to a wide range of complex, familiar and unfattal command of a broad range of knowledge	Examir knowledge and skills required logical thinking, with evidenamiliar situations. Apply high	ation ired for a ce of origi hly effect	Dec May Ittaining all the course nal thought, and abilit ive organizational and ast most of the course	
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Not for st STAT160 (This cour Y 1st A	udents who have 3, STAT2901 or EC se is available to sem 2nd sem 0 Demonstrate thoroug learning outcomes. So apply knowledge presentational skills. Demonstrate substar learning outcomes. So and some unfamiliar	passed or already enrolled in any of CON1280 tudents pursuing a major/minor in Bust Offer in 2021 - 2022 : Y in mastery at an advanced level of extensive how strong analytical and critical abilities and to a wide range of complex, familiar and untital command of a broad range of knowledge how evidence of analytical and critical abilities situations. Apply effective organizational and preserved.	Examir knowledge and skills required logical thinking, with evidenamiliar situations. Apply high and skills required for attal and logical thinking, and abil esentational skills.	eation ired for a ce of origi hly effect ning at lea ity to appl	Dec May Ittaining all the course nal thought, and abilit ive organizational and ast most of the course y knowledge to familia	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Not for st STAT160 (This cour Y 1st A B	udents who have 3, STAT2901 or EC se is available to s sem 2nd sem 0 Demonstrate thoroug learning outcomes. S to apply knowledge presentational skills. Demonstrate substar learning outcomes. S and some unfamiliar outcomes. So and some unfamiliar situations. App	passed or already enrolled in any of CON1280 tudents pursuing a major/minor in Bust of the pursuing a major/minor in Bust of the pursuing a major/minor in Bust of the pursuing analytical and critical abilities and to a wide range of complex, familiar and unful titial command of a broad range of knowledge how evidence of analytical and critical abilities situations. Apply effective organizational and presence of some analytical and critical abilities ply moderately effective organizational and presence of some analytical and critical abilities ply moderately effective organizational and presence of some analytical and critical abilities.	Examir knowledge and skills required logical thinking, with evidenamiliar situations. Apply high and skills required for attained logical thinking, and abiresentational skills. d skills required for attaining and logical thinking, and absentational skills.	ation ired for a se of origi hly effect ning at lea ity to appl ag most of	Dec May Ittaining all the course nal thought, and abilit ive organizational and ast most of the course y knowledge to familia of the course learning ply knowledge to mos	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Not for st STAT160 (This cour Y 1st A B C	udents who have 3, STAT2901 or EC se is available to s sem 2nd sem 0 Demonstrate thoroug learning outcomes. S to apply knowledge presentational skills. Demonstrate substar learning outcomes. S and some unfamiliar a outcomes. Show evid familiar situations. Ap Demonstrate partial to Show evidence of so knowledge to solve p	passed or already enrolled in any of CON1280 tudents pursuing a major/minor in Bustoner in 2021 - 2022: You have the analytical and critical abilities and to a wide range of complex, familiar and unfutial command of a broad range of knowledge how evidence of analytical and critical abilities situations. Apply effective organizational and presult incomplete command of knowledge and sense of some analytical and critical abilities ply moderately effective organizational and presult limited command of knowledge and skills roberent and logical thinking, but with limite roblems. Apply limited or barely effective organization or grant content and logical thinking, but with limite roblems. Apply limited or barely effective organization or grant content and logical thinking, but with limite or bereits of the content and logical thinking, but with limite or bereits of the content and logical thinking, but with limite or barely effective organization or grant content and logical thinking the properties of the content and logical thinking, but with limite or barely effective organization or grant content and logical thinking the properties of the content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties or grant content and logical thinking the properties o	Examir knowledge and skills required for attainand logical thinking, with evidenamiliar situations. Apply hig and skills required for attainand logical thinking, and abiresentational skills. d skills required for attaininand logical thinking, and abisentational skills. equired for attaining some of analytical and critical abilizational and presentational	ired for a ze of origi hly effect ning at lea ity to appl ag most c slility to appl of the courties. Show skills.	Dec May Ittaining all the course nal thought, and abilit ive organizational and ast most of the course y knowledge to familia of the course learning ply knowledge to mos rse learning outcomes v limited ability to appl	
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Not for st STAT160 (This cour Y 1st A B	udents who have 3, STAT2901 or EC se is available to s sem 2nd sem 0 Demonstrate thoroug learning outcomes. S to apply knowledge presentational skills. Demonstrate substar learning outcomes. S and some unfamiliar in Demonstrate genera outcomes. Show evit familiar situations. Ap Demonstrate partial it Show evidence of sook knowledge to solve p Demonstrate little or of analytical and crif	passed or already enrolled in any of CON1280 tudents pursuing a major/minor in Buston Differ in 2021 - 2022: Y In mastery at an advanced level of extensive how strong analytical and critical abilities and to a wide range of complex, familiar and unfutial command of a broad range of knowledge how evidence of analytical and critical abilities situations. Apply effective organizational and presidence of some analytical and critical abilities ply moderately effective organizational and presult limited command of knowledge and skills reme coherent and logical thinking, but with limited command of logical thinking, but with limited command possible control of the coherent and logical thinking, but with limited command of knowledge and skills reme coherent and logical thinking, but with limited.	Examir knowledge and skills required for attainand logical thinking, with evidenamiliar situations. Apply high and skills required for attainand logical thinking, and abigesentational skills. d skills required for attaining and logical thinking, and abigenational skills. equired for attaining some of a danalytical and critical abilitizational and presentational lills required for attaining the Show very little or no abilities.	ation ired for a ired	Dec May Ittaining all the course and thought, and abilit live organizational and ast most of the course y knowledge to familia of the course learning ply knowledge to mos rse learning outcomes v limited ability to appl tearning outcomes. Lac	
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Not for st STAT160 (This cour Y 1st A B C D Fail	udents who have 3, STAT2901 or EC se is available to s sem 2nd sem 0 Demonstrate thoroug learning outcomes. S to apply knowledge presentational skills. Demonstrate substar learning outcomes. S and some unfamiliar in Demonstrate genera outcomes. Show evit familiar situations. Ap Demonstrate partial it Show evidence of sook knowledge to solve p Demonstrate little or of analytical and crif	passed or already enrolled in any of CON1280 tudents pursuing a major/minor in Bustonetts pursuing a major/minor in Bustonetts pursuing a major/minor in Bustonetts pursuing a major/minor in Bustonetts and a major pursuing a maj	Examir knowledge and skills required for attainand logical thinking, with evidenamiliar situations. Apply high and skills required for attainand logical thinking, and abigesentational skills. d skills required for attaining and logical thinking, and abigenational skills. equired for attaining some of a danalytical and critical abilitizational and presentational lills required for attaining the Show very little or no abilities.	ation ired for a ired	Dec May Ittaining all the course and thought, and abilit live organizational and ast most of the course y knowledge to familia of the course learning ply knowledge to mos rse learning outcomes v limited ability to appl tearning outcomes. Lac	
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Not for st STAT160 (This cour Y 1st A B C D Fail	udents who have 3, STAT2901 or EC se is available to s sem 2nd sem 0 Demonstrate thoroug learning outcomes. S to apply knowledge presentational skills. Demonstrate substar learning outcomes. S and some unfamiliar in Demonstrate genera outcomes. Show evit familiar situations. Ap Demonstrate partial to Show evidence of sook knowledge to solve p Demonstrate little or of analytical and criproblems. Organizations ased course	passed or already enrolled in any of CON1280 tudents pursuing a major/minor in Bustonetts pursuing a major/minor in Bustonetts pursuing a major/minor in Bustonetts pursuing a major/minor in Bustonetts and a major pursuing a maj	Examir knowledge and skills required for attainand logical thinking, with evidenamiliar situations. Apply high and skills required for attainand logical thinking, and abigesentational skills. d skills required for attaining and logical thinking, and abigenational skills. equired for attaining some of a danalytical and critical abilitizational and presentational lills required for attaining the Show very little or no abilities.	ation ired for a ired	Dec May Ittaining all the course and thought, and abilit live organizational and ast most of the course y knowledge to familia of the course learning ply knowledge to mos rse learning outcomes v limited ability to appl tearning outcomes. Lac	
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Not for st STAT160 (This cour Y 1st A B C D Fail	udents who have 3, STAT2901 or EC se is available to s sem 2nd sem 0 Demonstrate thoroug learning outcomes. S to apply knowledge presentational skills. Demonstrate substar learning outcomes. S and some unfamiliar in Demonstrate genera outcomes. Show evit familiar situations. Ap Demonstrate partial to Show evidence of sook knowledge to solve p Demonstrate little or of analytical and criproblems. Organizations ased course	passed or already enrolled in any of CON1280 tudents pursuing a major/minor in Buston tudents pursuing a major/minor in Buston to a wide range of complex, familiar and unformatical and critical abilities and to a wide range of complex, familiar and unformatical command of a broad range of knowledge show evidence of analytical and critical abilities situations. Apply effective organizational and presult limited command of knowledge and but incomplete command of knowledge and presult limited command of knowledge and presult limited command of knowledge and skills represented to the control of the cont	Examir knowledge and skills required for attainand logical thinking, with evidenamiliar situations. Apply high and skills required for attainand logical thinking, and abigesentational skills. d skills required for attaining and logical thinking, and abigenational skills. equired for attaining some of a danalytical and critical abilitizational and presentational lills required for attaining the Show very little or no abilities.	ation ired for a ired	Dec May Italining all the course nal thought, and abilit ive organizational and ast most of the course y knowledge to familia of the course learning ply knowledge to mos rese learning outcomes v limited ability to appl earning outcomes. Lac y knowledge to solve	
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Not for st STAT160 (This cour Y 1st A B C D Fail Lecture-b Activities	udents who have 3, STAT2901 or EC se is available to s sem 2nd sem 0 Demonstrate thoroug learning outcomes. S to apply knowledge presentational skills. Demonstrate substar learning outcomes. S and some unfamiliar in Demonstrate genera outcomes. Show evit familiar situations. Ap Demonstrate partial to Show evidence of sook knowledge to solve p Demonstrate little or of analytical and criproblems. Organizations ased course	passed or already enrolled in any of CON1280 tudents pursuing a major/minor in Buston tudents pursuing a major/minor in Buston to a wide range of complex, familiar and unformatical and critical abilities and to a wide range of complex, familiar and unformatical command of a broad range of knowledge show evidence of analytical and critical abilities situations. Apply effective organizational and presult limited command of knowledge and but incomplete command of knowledge and presult limited command of knowledge and presult limited command of knowledge and skills represented to the control of the cont	Examir knowledge and skills required for attainand logical thinking, with evidenamiliar situations. Apply high and skills required for attainand logical thinking, and abigesentational skills. d skills required for attaining and logical thinking, and abigenational skills. equired for attaining some of a danalytical and critical abilitizational and presentational lills required for attaining the Show very little or no abilities.	ation ired for a ired	Dec May Italining all the course nal thought, and abilit ive organizational and ast most of the course y knowledge to familia of the course learning ply knowledge to most rese learning outcomes y limited ability to appl earning outcomes. Lac y knowledge to solve No. of Hours	
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Not for st STAT160: (This cour Y 1st A B C D Fail Lecture-b: Activities Lectures Tutorials	udents who have 3, STAT2901 or EC se is available to s sem 2nd sem 0 Demonstrate thoroug learning outcomes. S to apply knowledge presentational skills. Demonstrate substar learning outcomes. S and some unfamiliar in Demonstrate genera outcomes. Show evit familiar situations. Ap Demonstrate partial to Show evidence of sook knowledge to solve p Demonstrate little or of analytical and criproblems. Organizations ased course	passed or already enrolled in any of CON1280 tudents pursuing a major/minor in Buston tudents pursuing a major/minor in Buston to a wide range of complex, familiar and unformatical and critical abilities and to a wide range of complex, familiar and unformatical command of a broad range of knowledge show evidence of analytical and critical abilities situations. Apply effective organizational and presult limited command of knowledge and but incomplete command of knowledge and presult limited command of knowledge and presult limited command of knowledge and skills represented to the control of the cont	Examir knowledge and skills required for attainand logical thinking, with evidenamiliar situations. Apply high and skills required for attainand logical thinking, and abigesentational skills. d skills required for attaining and logical thinking, and abigenational skills. equired for attaining some of a danalytical and critical abilitizational and presentational lills required for attaining the Show very little or no abilities.	ation ired for a ired	Dec May Ittaining all the course nal thought, and abilit ive organizational and ast most of the course y knowledge to familia of the course learning ply knowledge to most rese learning outcomes y limited ability to appl sarning outcomes. Lac y knowledge to solve No. of Hours 36	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Not for st STAT160: (This cour Y 1st A B C D Fail Lecture-b: Activities Lectures Tutorials	udents who have 3, STAT2901 or EC se is available to se is available to se is available to se is available to se is available to se is available to se is available to se is apply knowledge presentational skills. Demonstrate substar learning outcomes. Se and some unfamiliar outcomes. Some evic familiar situations. Ap Demonstrate partial to Show evidence of sook knowledge to solve per Demonstrate little or of analytical and crit problems. Organization assed course	passed or already enrolled in any of CON1280 tudents pursuing a major/minor in Buston tudents pursuing a major/minor in Buston to a wide range of complex, familiar and unformatical and critical abilities and to a wide range of complex, familiar and unformatical command of a broad range of knowledge show evidence of analytical and critical abilities situations. Apply effective organizational and presult limited command of knowledge and but incomplete command of knowledge and presult limited command of knowledge and presult limited command of knowledge and skills represented to the control of the cont	Examir knowledge and skills required for attainand logical thinking, with evidenamiliar situations. Apply high and skills required for attainand logical thinking, and abigesentational skills. d skills required for attaining and logical thinking, and abigenational skills. equired for attaining some of a danalytical and critical abilitizational and presentational lills required for attaining the Show very little or no abilities.	ration ired for a se of original ired for a second for a	Dec May Ittaining all the course nal thought, and abilit ive organizational and ast most of the course y knowledge to familia of the course learning ply knowledge to most rse learning outcomes v limited ability to appl arning outcomes. Lac y knowledge to solve No. of Hours 36 12	

		tutorials, and a class test)		
	Examination	One 2-hour written examination	75	CLO 1,2,3,4,5,6,7,8
Required/recommended reading and online materials	Gerald Keller: Managerial Statistics Freund, J. E. & Perles, B. M.: Mod- Berk, K.N. & Carey, P.: Data Analy Bowerman, B.L. & O'Connell, E.S.	ern Elementary Statistics (Prentice sis with Microsoft EXCEL (Duxbury	Hall, 2006, 12th ed.) v press, Update Office 200	
Course Website	http://moodle.hku.hk			

STAT1603	Introduc	ctory statistics (6 c	redits)	Academic Yea	r 2020		
Offering Department		& Actuarial Science	,	Quota			
Course Co-ordinator			rial Science (hrntlkf@hku.hk)	quotu			
Teachers Involved		Lam, Statistics & Actua	, ,				
Todollolo Ilivolvod		Jing, Statistics & Actuar					
Course Objectives	data need descriptive this cours	The discipline of statistics is concerned with situations involving uncertainty and variability. The interpretation of lata needs special techniques when variability plays a role, as it usually does. Thus statistics forms an important descriptive and analytical tool of many scientific disciplines. Candidates with a mathematical background will find his course suitable, because the language of mathematics allows the subject of statistics to be presented with					
		and clarity.					
Course Contents & Topics	Probability Estimation	Presentation of data, Variability and Uncertainty, Measures of Central Tendency, Measures of Dispersion, Basic Probability Theory and Techniques, Random Variables and Probability Distributions, Random Samples, Point Estimation, Normal Sampling Theorem, Confidence Intervals, Hypotheses Testing, Simple Linear Regression and Correlation.					
Course Learning	On succes	ssful completion of this	course, students should be able to:				
Outcomes		•	res of central tendency and dispersior				
	CLO 3 km pc CLO 4 us	now how to construct oppulation	obability theory and techniques to solve confidence intervals and use hypoth-	eses testing to carry ou			
Pre-requisites	(Level 2 o	r above in HKDSE Mat	hematics Extended Module 1 or 2 or e	quivalent) or			
(and Co-requisites and Impermissible combinations)	and	udents who have passe	of these courses: MATH1009, MATH		,		
Offer in 2020 - 2021			in 2021 - 2022 : Y	Examination	Dec May		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail	of analytical and critical a problems. Organization an	idence of command of knowledge and skills re- abilities, logical and coherent thinking. Show d presentational skills are minimally effective or	very little or no ability to app			
Course Type	_	ased course	I				
Course Teaching	Activities	3	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials	/ O - If - t l			12		
Accomment Mathed		Self study	Detaile	Maintain 1 Co.	100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	Coursework (assignments,	25	0.04004		
			tutorials, and class test(s))		CLO 1,2,3,4		
		ion	tutorials, and class test(s)) One 2-hour written examination				
Required/recommended	Examinat		One 2-hour written examination	75	CLO 1,2,3,4		
reading and	Examinat Miller, I. a Hogg, R. \ Freund, J. Fernande: Hooke, R. Levine, D	nd Miller, M. (2014). Jo V., Tanis, E. A., and Zir . E. and Perles B. M. (2 s, M. (2009). Statistics (1983). How to Tell the . M., Stephan, D. F.,		75 s with Applications (8th E d Statistical Inference (9t dition). Prentice Hall. on. lekker.	CLO 1,2,3,4 dition). Pearson. h Edition). Pearson		
reading and	Examinat Miller, I. a Hogg, R. Y Freund, J. Fernander Hooke, R. Levine, D Edition). F Larson, R Bluman, A Triola, M.	nd Miller, M. (2014). Jo V., Tanis, E. A., and Zir . E. and Perles B. M. (2 s, M. (2009). Statistics (1983). How to Tell the . M., Stephan, D. F., Pearson. . and Farber, B. (2015) A. G. (2014). Elementar F. (2018). Elementary	One 2-hour written examination hn E. Freund's Mathematical Statistics mmerman, D. L. (2015). Probability an 003). Statistics: A First Course (8th Edfor Business and Economics. Bookbook Liars from the Statisticians. Marcel D	75 s with Applications (8th E d Statistical Inference (9t dition). Prentice Hall. on. lekker. for Managers Using M Vorld (6th Edition). Pears (9th Edition). McGraw-Hi	CLO 1,2,3,4 dition). Pearson. h Edition). Pearson icrosoft Excel (8th on.		
Required/recommended reading and online materials	Examinat Miller, I. a Hogg, R. V Freund, J. Fernander Hooke, R. Levine, D Edition). F Larson, R Bluman, A Triola, M. Newbold, Pearson.	nd Miller, M. (2014). Jo V., Tanis, E. A., and Zir . E. and Perles B. M. (2 s, M. (2009). Statistics (1983). How to Tell the . M., Stephan, D. F., Pearson. . and Farber, B. (2015) A. G. (2014). Elementar F. (2018). Elementary	One 2-hour written examination hn E. Freund's Mathematical Statistics mmerman, D. L. (2015). Probability an 003). Statistics: A First Course (8th Edfor Business and Economics. Bookbook e Liars from the Statisticians. Marcel Dand Szabat, K. A. (2016). Statistics. Elementary Statistics: Picturing the Vy Statistics: A Step by Step Approach Statistics (13th Edition). Pearson.	75 s with Applications (8th E d Statistical Inference (9t dition). Prentice Hall. on. lekker. for Managers Using M Vorld (6th Edition). Pears (9th Edition). McGraw-Hi	CLO 1,2,3,4 dition). Pearson. h Edition). Pearson icrosoft Excel (8th on.		

	Probability and statistics I (6 credits) Academic Ye				r 2020		
Offering Department	Statistics	& Actuarial Science		Quota			
Course Co-ordinator	Dr K P W	lat, Statistics & Actuarial	Science (watkp@hku.hk)				
Teachers Involved	(Dr K P V	Vat,Statistics & Actuarial	Science)				
Course Objectives	forms an problems	important descriptive an this course develops rele	erned with situations in which uncert d analytical tool in many practical p evant probability models for the des	problems. Against a backgr cription of such uncertainty	ound of motivating and variability.		
Course Contents & Topics	Discrete binomial, Probabilit Joint dist	Sample spaces; Operations of events; Probability and probability laws; Conditional probability; Independence; Discrete random variables; Cumulative distribution function (cdf); Probability mass function (pmf); Bernoulli, binomial, geometric, and Poisson distributions; Continuous random variables; Cumulative distribution function (cdf); Probability density function (pdf); Exponential, Gamma, and normal distributions; Functions of a random variable; Joint distributions; Marginal distributions; Independent random variables; Functions of jointly distributed random variables; Expected value; Variance and standard deviation; Covariance and correlation.					
Course Learning	On succe	n successful completion of this course, students should be able to:					
Outcomes	CLO 1	understand the basic	c concepts in probability theory				
	CLO 2		o statistics and inference				
	CLO 3		olem by using probability calculation	S			
	CLO 4	pursue their further s	, ,,				
Pre-requisites (and Co-requisites and Impermissible combinations)	thereafter Pass in M Pass in M Not for st	Pass or already enrolled in MATH2014, or (MATH2101 and MATH2211), for students admitted in 2014 or hereafter; or Pass in MATH1013, or already enrolled in this course, for students admitted in 2013 or before; or Pass in MATH1851 and MATH1853, for students admitted in 2013 or before; and Not for students who have passed in STAT1603, or already enrolled in this course; Not for students who have passed in STAT2901, or already enrolled in this course; and					
Offer in 2020 - 2021		t sem 2nd sem Offer	in 2021 - 2022 · Y	Examination	Dec May		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning						
		outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve					
	Fail	knowledge to solve problem Demonstrate little or no evid	s. Apply limited or barely effective organization of command of knowledge and skills r	onal and presentational skills. equired for attaining the course le	limited ability to apply arning outcomes. Lack		
Course Type		knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and	s. Apply limited or barely effective organization of command of knowledge and skills r	onal and presentational skills. equired for attaining the course le v very little or no ability to apply	limited ability to apply arning outcomes. Lack		
•	Lecture-b	knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and passed course	is. Apply limited or barely effective organizati- dence of command of knowledge and skills ro lilities, logical and coherent thinking. Show presentational skills are minimally effective of	onal and presentational skills. equired for attaining the course le v very little or no ability to apply	r limited ability to apply arning outcomes. Lack y knowledge to solve		
Course Teaching	Lecture-b	knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and passed course	is. Apply limited or barely effective organization dence of command of knowledge and skills republikies, logical and coherent thinking. Show	onal and presentational skills. equired for attaining the course le v very little or no ability to apply	v limited ability to apply arning outcomes. Lack y knowledge to solve		
Course Teaching	Lecture-b Activitie Lectures	knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and Dassed course	is. Apply limited or barely effective organizati- dence of command of knowledge and skills ro lilities, logical and coherent thinking. Show presentational skills are minimally effective of	onal and presentational skills. equired for attaining the course le v very little or no ability to apply	v limited ability to apply arning outcomes. Lack y knowledge to solve No. of Hours 36		
Course Teaching	Lecture-b Activitie Lectures Tutorials	knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and cased course	is. Apply limited or barely effective organizati- dence of command of knowledge and skills ro lilities, logical and coherent thinking. Show presentational skills are minimally effective of	onal and presentational skills. equired for attaining the course le v very little or no ability to apply	v limited ability to apply arning outcomes. Lack y knowledge to solve No. of Hours 36 12		
Course Teaching & Learning Activities Assessment Methods	Lecture-b Activitie Lectures Tutorials	knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and cased course s / Self study	is. Apply limited or barely effective organizati- dence of command of knowledge and skills ro lilities, logical and coherent thinking. Show presentational skills are minimally effective of	onal and presentational skills. equired for attaining the course le v very little or no ability to apply	v limited ability to apply arning outcomes. Lack y knowledge to solve No. of Hours 36		
Course Teaching & Learning Activities Assessment Methods	Lecture-b Activitie Lectures Tutorials Reading	knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and passed course as / Self study	is. Apply limited or barely effective organization of command of knowledge and skills rolidities, logical and coherent thinking. Show presentational skills are minimally effective of the command of the coherent thinking. Show presentational skills are minimally effective of the coherent thinking. Show presentational skills are minimally effective of the coherent coheren	onal and presentational skills. equired for attaining the course le very little or no ability to apply or ineffective. Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO 1,2,3		
Course Teaching & Learning Activities Assessment Methods	Lecture-b Activitie Lectures Tutorials Reading Methods	knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and based course ss / Self study selections	is. Apply limited or barely effective organizatione of command of knowledge and skills rolilities, logical and coherent thinking. Show presentational skills are minimally effective of the command of th	onal and presentational skills. equired for attaining the course le very little or no ability to apply or ineffective. Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping		
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Lecture-b Activitie Lectures Tutorials Reading Methods Assignm Examina DeGroot, Ross, S.I. Miller, I. Prentice Hogg, R. Prentice	knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and based course 15 16 17 18 19 19 19 19 19 19 19 19 19 19 19 19 19	is. Apply limited or barely effective organization of command of knowledge and skills rolidities, logical and coherent thinking. Show presentational skills are minimally effective of the command of the coherent thinking. Show presentational skills are minimally effective of the coherent thinking. Show presentational skills are minimally effective of the coherent coheren	onal and presentational skills. equired for attaining the course le very little or no ability to apply or ineffective. Weighting in final course grade (%) 30 70 4th edition). Boston: Addis saddle River: Prentice Hall. istics with Applications (8th	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3 on-Wesley. n edition). Boston:		

STAT2602	Probability and statistics II (6 credits)	Academic Year	2020
Offering Department	Statistics & Actuarial Science	Quota	
Course Co-ordinator	Dr K Zhu, Statistics & Actuarial Science (mazhuke@hku.hk)		
Teachers Involved	(Dr K Zhu,Statistics & Actuarial Science) (Dr Z Liu,Statistics & Actuarial Science)		
Course Objectives	This course builds on STAT2601, introducing further the concepts and method two major areas of statistical analysis: estimation and hypothesis testing. The modelling, inference and decision making, students will be equipped with bot perceptions essential for making rigorous statistical analysis of real-life data.	rough the discipli	nes of statistical
Course Contents & Topics	1. Overview: random sample; sampling distributions of statistics; moment gener laws of large numbers and Central Limit Theorem; likelihood; sufficiency; factori 2. Estimation: estimator; bias; mean squared error; standard error; consistenc Lower Bound; efficiency; method of moments; maximum likelihood estimator; 3. Hypothesis testing: types of hypotheses; test statistics; p-value; size; po Pearson Lemma; generalized likelihood ratio test; Pearson chi-squared test; Wa 4. Confidence interval: confidence level; confidence limits; equal-tailed interval tests.	sation criterion; by; Fisher informat wer; likelihood ra ild tests;	ion; Cramer-Rao tio test; Neyman-
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 apprehend the objectives of statistics and its relation to probability theo	ry	

Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited abilities to a knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lecture-based course Course Type Lecture-based course Course Teaching & Lectures Details No. of Hours Lectures 36 Tutorials Peading / Self study No. of Hours Lectures 36 Tutorials Peading / Self		CLO 2 re	CLO 2 relate a real-life problem to a formal framework for statistical inference				
Pre-requisites (and Co-requisites (and Co-requisites (and Co-requisites (and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the cou- learning outcomes. Show strong analytical and critical abilities. Apply highly effective original companies of the cou- learning outcomes. Show evidence of analytical and critical abilities. Apply highly effective original companies of the cou- learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to a wide reape of complex, familiar and unifies analytical and critical abilities. Apply highly effective original command of a broad range of knowledge and skills required for attaining at least most of the cou- learning outcomes. Show evidence of snalytical and critical abilities and logical thinking, and ability to apply knowledge to a wide reaper and presentational skills. Demonstrate general but incomplete command of knowledge and skills required for attaining at least most of the cou- learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to an advanced and critical abilities and logical thinking, and ability to apply knowledge to an advanced and critical abilities and logical thinking, and ability to apply knowledge to an advanced and critical abilities and logical thinking, and ability to apply knowledge to see a course and presentational abilities and logical thinking, and ability to apply knowledge to see a course and presentational abilities and presentational skills. Pail Demonstrate general but incomplete command of knowledge and skills required for attaining at least most of the course learning outcomes. In the course learning outcomes are advanced to the problems of the course learning outcomes. In the course learning outcomes are advanced to the problems of the course learning outcomes		CLO 3 co	onduct standard parame	tric statistical inference by means o	f estimation and hypothes	sis testing	
Not for students who have passed in STAT3902, or already enrolled in this course. A lampermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show storing analytical and critical abilities and logical thinking, with evidence of original thought, and at to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to fam and some unfamiliar situations. Apply indirective organizational and presentational skills. C Demonstrate partial but limited command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to a familiar situations. Apply moderately effective organizational and presentational skills. D Demonstrate partial but limited command of knowledge and skills required for attaining attention and the standard critical abilities, and critical abilities, and analytical and critical abilities. Spicial and critical abilities, and analytical and critical abilities and logical thinking, but with limited analytical and critical abilities. Spicial and coherent thinking. Show very little or no ability to apply knowledge to see problems. Papply limited or barely effective organizational and presentational skills. Fail Demonstrate partial but limited command of knowledge and skills required for attaining and activate abilities, and activate abilities, and analytical and critical abilities, and analytical and critical abilities, and a knowledge to see problems. Papply limited or showledg		CLO 4 reckon the general applicability of statistics in a broad range of subject areas					
A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the coulearning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and at to apply knowledge to a wide range of complex, familial and unfamiliar situations. Apply highly effective organizational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the coulearning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to farm and some unfamiliar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learn outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to farm familiar situations. Apply moderately effective organizational and presentational skills. D D Demonstrate partial but limited command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited abilities and constrained analytical and critical abilities. Show limited abilities and constrained analytical and critical abilities. Show limited abilities are minimally effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining most of the course learning outcomes. In a constraint of analytical and critical abilities and coherent thinking, and ability to apply knowledge to see problems. Organizational and critical abilities and coherent thinking. Show very little or no ability to apply knowledge or see problems. Organizational and critical abilities. Given and analytical and critical abilities and accommand of knowledge and skills required	and Co-requisites and Impermissible						
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Assessment Methods and Weighting Methods Coursework (assignments, tutorials and a class test) Examination Required/recommended reading and conline materials Required Reversible Review (assignments, tutorials and a class test) Examination Berry, D.A. & Lindgren, B.W. (1996). Statistics: Theory and Methods. Duxbury: Belmont. Bickel, P.J. & Doksum, K.A. (2001). Mathematical Statistics: Basic Ideas and Selected Topics. Prentice Hall: Up Saddle River, N.J. Hogg, R.V. & Craig, A.T. (1989). Introduction to Mathematical Statistics with Applications. Pearson Prentice Hulper Saddle River.		Tutorials				12	
Assignments Coursework (assignments, tutorials and a class test) Examination Berry, D.A. & Lindgren, B.W. (1996). Statistics: Theory and Methods. Duxbury: Belmont. Bickel, P.J. & Doksum, K.A. (2001). Mathematical Statistics: Basic Ideas and Selected Topics. Prentice Hall: Up Saddle River, N.J. Hogg, R.V. & Craig, A.T. (1989). Introduction to Mathematical Statistics with Applications. Pearson Prentice Hupper Saddle River.		Reading /	Self study			100	
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Bickel, P.J. & Doksum, K.A. (2001). Mathematical Statistics: Basic Ideas and Selected Topics. Prentice Hall: Up Saddle River, N.J. Hogg, R.V. & Craig, A.T. (1989). Introduction to Mathematical Statistics. Macmillan: New York. Miller, I. & Miller, M. (2004). John E. Freund's Mathematical Statistics with Applications. Pearson Prentice Hupper Saddle River.		Examinati	on	One 2-hour written examination	75	CLO 1,2,3,4	
	reading and	Berry, D.A. & Lindgren, B.W. (1996). Statistics: Theory and Methods. Duxbury: Belmont. Bickel, P.J. & Doksum, K.A. (2001). Mathematical Statistics: Basic Ideas and Selected Topics. Prentice Hall: Upper Saddle River, N.J. Hogg, R.V. & Craig, A.T. (1989). Introduction to Mathematical Statistics. Macmillan: New York. Miller, I. & Miller, M. (2004). John E. Freund's Mathematical Statistics with Applications. Pearson Prentice Hall:					
	Course Website						

STAT2603	Data ma	nagement with SAS (6 credits)	Ac	cademic Year	2020		
Offering Department	Statistics	& Actuarial Science	Qı	uota			
Course Co-ordinator	Dr G C S	Dr G C S Lui, Statistics & Actuarial Science (csglui@hku.hk)					
Teachers Involved	(Dr G C S	(Dr G C S Lui, Statistics & Actuarial Science)					
Course Objectives	elementa different d	his course is designed for students who want to learn the statistical software (SAS) for data management and lementary data analysis. This course focuses on using SAS to manage data set input and output, work with ifferent data types, manipulate and transform data, perform random sampling and descriptive data analysis, and reate summary reports and graphics.					
Course Contents & Topics	topics, in manipulat	Data management system for statistical projects. Data validation and cleaning techniques. SAS programming topics, including the following: Data set input and output. Working with different data types. Data manipulation. Data transformation. File manipulation. File management. Data reporting, summarization, presentation and graphics. Basic data analysis. Structured query language.					
Course Learning	On succe	ssful completion of this course, students should be	able to:				
Outcomes	CLO 1 a	cess online help and document					
	CLO 2 us	e Data Step to create data files					
	CLO 3 st	ımmarize data by PROC MEANS, PROC FREQ, a	nd PROC UNIVARIATE	=			
	CLO 4 work with numeric, character, and date variables and functions in Data Step						
	CLO 5 perform conditional processing in Data Step						
Pre-requisites (and Co-requisites and Impermissible combinations)	P	AS data sets by Data Step and PROC TRANSP ROC APPEND; present data in a readable way by PROC SGPLOT, HTML output by ODS; procedur TAT1600 or MATH1821, or already enrolled in this	PROC TABULATE; por structured quality	roduce high-res			
Offer in 2020 - 2021	N Off	er in 2021 - 2022 : N	E	camination			
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advanced level of externing outcomes. Show strong analytical and critical abilitit to apply knowledge to a wide range of complex, familiar a presentational skills.	ktensive knowledge and skill es and logical thinking, with	ls required for atta evidence of origina	l thought, and ability		
	В	·					
	С						
	D	Demonstrate partial but limited command of knowledge and Show evidence of some coherent and logical thinking, but w knowledge to solve problems. Apply limited or barely effective	skills required for attaining tith limited analytical and critic	cal abilities. Show I			
	Fail	Demonstrate little or no evidence of command of knowledge of analytical and critical abilities, logical and coherent thin	and skills required for attain	ing the course lear			

	problems. Organizat	tion and presentational skills are minimally effective o	r ineffective.			
Course Type	Lecture-based course					
Course Teaching & Learning Activities	Activities	No. of Hours				
	Lectures					
	Tutorials			12		
	Reading / Self study			100		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments	Coursework (assignments, tutorials, and class test(s))	40	CLO 1,2,3,4,5,6		
	Examination	One 2-hour written examination	60	CLO 1,2,3,4,5,6		
Required/recommended reading and online materials	Cody, R.P.: Learning SAS by Example: A Programmer's Guide (North Carolina: SAS Institute Inc., 2007) SAS: SAS Certification Prep Guide: Base Programming for SAS 9. Third Edition. (SAS Institute Inc., 2011) Bailer, J.: Statistical Programming in SAS. North Carolina: (SAS Institute Inc., 2010) Delwiche, L. and Slaughter, S.: The Little SAS Book: A Primer. Fifth Edition. (SAS Institute Inc., 2012) Cody, R. P.: Cody's Data Cleaning Techniques Using SAS System (North Carolina: SAS Institute, 2008, 2nd edition) SAS: Step by Step Programming with Base SAS Software (North Carolina: SAS Publishing, 2001)					
Course Website	http://moodle.hku.hk	g 2222 27.2 Contrain (Horar Care		· · /		

STAT2604	Introduc	tion to R progra	amming and elementary data analy	sis Academic Ye	ar 2020	
	(6 credit	s)			2020	
Offering Department	Statistics 8	& Actuarial Science		Quota	50	
Course Co-ordinator	Dr Z Liu, S	Or Z Liu, Statistics & Actuarial Science (zhhliu@hku.hk)				
Teachers Involved	(Dr Z Liu,S	Statistics & Actuaria	l Science)			
Course Objectives	language elementar work with	R. This course foci y statistical analysi different data typ	provide a first-level introduction to the po- uses on learning the basic programming s s. The programming skills involved can be ses, manipulation and transformation of rofessional summary reports with high-qua	kills in R with examples e applied to input and data, random samplin	and applications in output of data sets	
Course Contents & Topics	2. The R e 3. Probabi continuous 4. Descrip summary	 R basics: first steps; language essentials. The R environment: session management; the graphics subsystem; R programming; data entry. Probability and distributions: random sampling; probability calculations and combinatorics; discrete distributions; continuous distributions; the built-in distributions in R. Descriptive statistics and graphics: summary statistics for a single group; graphical display of distributions; summary statistics by groups; graphics for grouped data; graphical display of tables. Simple linear regression: residuals and fitted values; prediction and confidence bands; correlation. 				
Course Learning	On succes	ssful completion of	this course, students should be able to:			
Outcomes	CLO 1	access online help	and documents for R			
	CLO 2	use R to input data	a, perform data transformation and merging	g, output data		
	CLO 3	summarize data in	tables and graphs for descriptive data and	alysis		
	CLO 4	work with numeric	, character, and other unstructured data ty	pes		
	CLO 5		nctions, loops and control flows			
	CLO 6 perform data management using SQL language in R					
	CLO 7		rlo simulations to validate statistical conce	ots		
(and Co-requisites and Impermissible combinations)		,		-		
Offer in 2020 - 2021		sem Offer in 202		Examination	Dec	
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning					
	outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	of analytical and criti	o evidence of command of knowledge and skills req cal abilities, logical and coherent thinking. Show want and presentational skills are minimally effective or it	very little or no ability to ap		
Course Type		ased course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents	Coursework (assignments, tutorials, and class test(s))	50	CLO 1,2,3,4,5,6,7	
	Examinat	ion	One 2-hour computer lab-based	50	CLO 1,2,3,4,5,6,7	
Required/recommended			examination y Statistics with R (Second Edition), Spring		020 1,2,0,1,0,0,1	

Course Website http://moodle.hku.hk

STAT2605	Demogr	aphic and socio-e	conomic statistics (6 credits)	Academic Ye	ear 2020		
Offering Department	Statistics	& Actuarial Science	,	Quota			
Course Co-ordinator	Ms L M S	Kwan, Statistics & Act	uarial Science (lucykwan@hku.hk)				
Teachers Involved	(Ms L M S	(Ms L M S Kwan,Statistics & Actuarial Science)					
Course Objectives	evidence- aims to p adopted s	The course covers the major methods for studying demographic and socio-economic statistics, with a quantitative evidence-based approach to understand the socio-economic well-being of residents in a territory. The course aims to provide students with 1) essential underlying principles and the pertinent methods behind internationally adopted statistical indicators; and 2) skills in the statistical descriptions and further analysis for application to planning, policy-making and commercial endeavours of a territory.					
Course Contents & Topics	Socio-eco Economic pertaining Sources,	Demographic statistics on population structure, fertility, mortality, migration, life tables, population projections; Socio-economic statistics on housing, labour, and social equity; Economic statistics on external trade, innovation, prices and GDP measurements (with emphasis on methods pertaining to some important economic sectors in the case of GDP). Sources, theory and methods of such statistics; Examples would be especially drawn from Hong Kong, neighbouring economies or comparable economies.					
Course Learning	On succes	ssful completion of this	course, students should be able to:				
Outcomes	CLO 1 de	scribe and interpret m	ajor official & other publicly dissemina	ated socio-economic stati	stics of a territory		
	CLO 3 pr	ong, neighbouring ecoredict a future situation	alyse the socio-economic well-being on the socio-economic well-being on the social soc		r reference to Hong		
Dua va vuiaita a		itically assess statistics		DCC Mathamatica Cytons	lad Madula 1 as 0 as		
Pre-requisites (and Co-requisites and Impermissible combinations)	èquivalen	t); and	athematics or Level 2 or above in HK .2102, ECON1280, STAT1601, STAT				
Offer in 2020 - 2021	Y 2nd	I sem Offer in 2021 -	2022 : N	Examination	May		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail	of analytical and critical problems. Organization ar	vidence of command of knowledge and skills r abilities, logical and coherent thinking. Show and presentational skills are minimally effective of	v very little or no ability to ap			
Course Type		ased course	1				
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
		Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	Coursework (assignments, tutorials and a test)	35	CLO 1,2,3,4		
	Examinat	ion	One 2-hour written examination	65	CLO 1,2,3,4		
Required/recommended reading and	Pollard A.	H., Yusuf F., & Pollard	sus & Statistics Department, Hong Ko	ergamon Press, 1990, 3rd	edition)		
online materials		•	conomic Statistics - an OECD Perspe	ctive (OECD, 2008)			
Course Website	nttp://moo	dle.hku.hk					

STAT2901	Probability and statistics: foundations of actuarial science (6 credits)	Academic Year	2020
Offering Department	Statistics & Actuarial Science	Quota	
Course Co-ordinator	Prof S M S Lee, Statistics & Actuarial Science (smslee@hku.hk)		
Teachers Involved	(Prof S M S Lee, Statistics & Actuarial Science)		
Course Objectives	The purpose of this course is to develop knowledge of the fundamental t quantitatively assessing risk. Applications of these tools to actuarial scie Students will have a thorough command of probability topics and the supportir	nce problems will	
Course Contents & Topics	1. General probability Basic elements of probability in set notation Mutually exclusive events Addition and multiplication rules Independence of events Combinatorial probability Conditional probability and expectations Bayes theorem / Law of total probability Random variables Univariate probability distributions (including binomial, negative binomial, uniform, exponential, chi-square, beta, Pareto, lognormal, gamma, Weibull distribution Probability functions and probability density functions		

	- Cumulati	ive distribution functions	3			
	- Mode, m					
	 - Variance and measures of dispersion - Central limit theorem 3. Sampling distributions and introduction of estimation 					
Course Learning		•	course, students should be able to:			
Outcomes			natical theory underlying the modern	nractice of statistics		
			ilistic analysis for problems involving			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Ma Pass in Ma	Pass in MATH1821 [for BSc(ActuarSc) students] or already enrolled in this course, or Pass in MATH1013 or already enrolled in this course [for students outside the BSc(ActuarSc) programme]; and Not for students who have passed or enrolled in any of these courses: STAT1601, STAT1602, STAT1603,				
·	Y 2nd	I sem Offer in 2021 - 2	2022 : Y	Examination	May	
Grade Descriptors (A+ to F)	A	learning outcomes. Show s	stery at an advanced level of extensive kno trong analytical and critical abilities and logic ride range of complex, familiar and unfamili	al thinking, with evidence of or	iginal thought, and ability	
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	of analytical and critical a	dence of command of knowledge and skills re bilities, logical and coherent thinking. Show I presentational skills are minimally effective o	very little or no ability to ap		
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials		tutorials/example classes			
	Reading /	Self study			12	
Assessment Methods and Weighting		·			100	
and Weighting	Methods	·	Details	Weighting in final course grade (%)		
and Weighting	Methods Assignme	ents	Coursework (assignments, tutorials, and a class test)	course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ion	Coursework (assignments, tutorials, and a class test) One 3-hour written examination	course grade (%) 25 75	100 Assessment Methods to CLO Mapping	
Required/recommended reading and online materials	Assignme Examinati Feller, W. Hassett, W. Hogg R.V. River. Ross, S.M Wackerly,	ion (1968). An Introduction <i>I</i> . and Stewart, D. (2006) . and Tanis E.A. (2009) 1. (2005). A First Course	Coursework (assignments, tutorials, and a class test) One 3-hour written examination to Probability Theory and Its Applica (5). Probability for Risk Management (1). Probability and Statistical Inference in Probability (7th Edition). Prentice and Scheaffer, R. (2008). Mathematic	course grade (%) 25 75 Itions. Wiley, New York. (2nd Edition). ACTEX Pulce (8th Edition). Prentice Hall: Upper Saddle Rive	Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3 blication: Winsted. Hall: Upper Saddle	

STAT2902	Financia	Il mathematics (6 credits)	Academic Year	2020			
Offering Department	Statistics 8	atistics & Actuarial Science Quota					
Course Co-ordinator	Prof K C Y	Prof K C Yuen, Statistics & Actuarial Science (kcyuen@hku.hk)					
Teachers Involved	(Prof K C	Yuen,Statistics & Actuarial Science)					
Course Objectives		se introduces the fundamental concepts of financial mathema ent of basic actuarial techniques. Practical applications of these	' '				
Course Contents & Topics	amortization mortgage	Key topics include: measurement of interest, annuities certain; discounted cash flow analysis; yield rates; amortization schedules and sinking funds; bonds and related securities; practical applications such as real estate mortgage and short sales; stochastic approaches to interest; and key terms of financial analysis such as yield curves, spot rates, forward rates, duration, convexity, and immunization.					
Course Learning	On succes	ssful completion of this course, students should be able to:					
Outcomes	CLO 1	understand basic concepts of financial mathematics					
	CLO 2	understand and formulate elementary financial problems					
	CLO 3 apply compound interest theory to tackle some practical financial problems						
	CLO 4 show an understanding of the term structure of interest rates						
	CLO 5	CLO 5 show an understanding of simple stochastic models for investment returns					
Pre-requisites (and Co-requisites		Pass in STAT2901, or already enrolled in this course; and Not for students who have passed in STAT3615, or already enrolled in this course.					
and Impermissible combinations)							
	Y 2nd	sem Offer in 2021 - 2022 : Y	Examination	May			
combinations)	Y 2nd	sem Offer in 2021 - 2022 : Y Demonstrate thorough mastery at an advanced level of extensive knowled learning outcomes. Show strong analytical and critical abilities and logical th to apply knowledge to a wide range of complex, familiar and unfamiliar si presentational skills.	dge and skills required for atta inking, with evidence of origina	aining all the course al thought, and ability			
combinations) Offer in 2020 - 2021 Grade Descriptors		Demonstrate thorough mastery at an advanced level of extensive knowled learning outcomes. Show strong analytical and critical abilities and logical the to apply knowledge to a wide range of complex, familiar and unfamiliar si	dge and skills required for attainking, with evidence of original tractions. Apply highly effective is required for attaining at least at thinking, and ability to apply	aining all the course al thought, and ability e organizational and at most of the course			
combinations) Offer in 2020 - 2021 Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowled learning outcomes. Show strong analytical and critical abilities and logical the to apply knowledge to a wide range of complex, familiar and unfamiliar supresentational skills. Demonstrate substantial command of a broad range of knowledge and skill learning outcomes. Show evidence of analytical and critical abilities and logic and some unfamiliar situations. Apply effective organizational and presentatic Demonstrate general but incomplete command of knowledge and skills routcomes. Show evidence of some analytical and critical abilities and logic	dge and skills required for attainking, with evidence of original tuations. Apply highly effectives required for attaining at leas all thinking, and ability to apply mal skills. equired for attaining most of all thinking, and ability to apply all thinking, and ability to apply mal skills.	aining all the course al thought, and ability e organizational and at most of the course knowledge to familial the course learning			
combinations) Offer in 2020 - 2021 Grade Descriptors	В	Demonstrate thorough mastery at an advanced level of extensive knowled learning outcomes. Show strong analytical and critical abilities and logical the to apply knowledge to a wide range of complex, familiar and unfamiliar signesentational skills. Demonstrate substantial command of a broad range of knowledge and skill learning outcomes. Show evidence of analytical and critical abilities and logic and some unfamiliar situations. Apply effective organizational and presentation Demonstrate general but incomplete command of knowledge and skills r	dge and skills required for attainking, with evidence of origina tuations. Apply highly effectives required for attaining at leas at thinking, and ability to apply onal skills. The decire of all thinking, and ability to apply all skills. The course or attaining some of the course cal and critical abilities. Show a land or titical abilities.	aining all the course al thought, and ability e organizational and it most of the course knowledge to familia the course learning y knowledge to mos e learning outcomes			

		critical abilities, logical and coherent thinking. Show tion and presentational skills are minimally effective o		oply knowledge to solve
Course Type	Lecture-based course			
Course Teaching	Activities	Details		No. of Hours
& Learning Activities	Lectures			36
	Tutorials	tutorials/example classes		12
	Reading / Self study			100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments	Coursework (assignments, tutorials, and class test(s))	25	CLO 1,2,3,4,5
	Examination	One 3-hour written examination	75	CLO 1,2,3,4,5
Required/recommended reading and online materials		of Interest (Irwin: Illinois, 2008, 3rd edition latics of Investment and Credit (ACTEX P		Books: Connecticut,
Course Website	http://moodle.hku.hk			

STAT3600	Linear st	tatistical analysis	s (6 credits)	Academic Y	ear 2020		
Offering Department	Statistics 8	& Actuarial Science	•	Quota			
Course Co-ordinator	Dr C Wang	g, Statistics & Actuari	ial Science (stacw@hku.hk)				
Teachers Involved	,	Dr C Wang,Statistics & Actuarial Science) Dr W T Li,Statistics & Actuarial Science)					
Course Objectives	techniques	e analysis of variability is mainly concerned with locating the sources of the variability. Many statistical chiques investigate these sources through the use of 'linear' models. This course presents the theory are actice of these models.					
Course Contents & Topics	tests and c (2) Multiple full models (3) One-wa (4) Two-w treatment (5) Univers and two-w (6) Regres	Simple linear regression: least squares method, analysis of variance, coefficient of determination, hypothesists and confidence intervals for regression parameters, prediction. Multiple linear regression: least squares method, analysis of variance, coefficient of determination, reduced volumedels, hypothesis tests and confidence intervals for regression parameters, prediction, polynomial regression on One-way classification models: one-way ANOVA, analysis of treatment effects, contrasts. Two-way classification models: interactions, two-way ANOVA for balanced data structures, analysis of parameter effects, contrasts, randomised complete block design. Universal approach to linear modelling: dummy variables, 'multiple linear regression' representation of one-wayd two-way (unbalanced) models, ANCOVA models, concomitant variables. Regression diagnostics: leverage, residual plot, normal probability plot, outlier, studentized residual, influential servation, Cook's distance, multicollinearity, model transformation.					
Course Learning			is course, students should be able to:				
Outcomes	CLO 2	inderstand ANOVA n	ression model with one or multiple ind nodels for one and two factors	•			
			near model with categorical and contir	nuous independent variab	les		
Pre-requisites (and Co-requisites and Impermissible combinations)		FAT2602; and dents who have pass	sed in STAT3907, or have already enr	rolled in this course.			
Offer in 2020 - 2021	Y 1st	sem 2nd sem Off	fer in 2021 - 2022 : Y	Examination	Dec May		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lact of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-ba	ased course					
Course Teaching	Activities		Details		No. of Hours 36		
& Learning Activities	Lectures						
	Tutorials	0 15 1 1			12		
Accessment Mathad		Self study	Dataila	Maintain 1 C 1	100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	nts	Coursework (assignments, tutorials and a test)	25	CLO 1,2,3		
	Examinati		One 2-hour written examination	75	CLO 1,2,3		
Required/recommended reading and online materials	Hill/Irwin; 5 Berry, D. A Draper, N. Krzanowsk	5th edition) A. & Lindgren, B. W.: R. & Smith, H.: Appl ki, W. J.: An Introduc	J. Nachtsheim, John Neter, William Statistics: Theory and Methods (Duxtiled Regression Analysis (Wiley, New tion to Statistical Modelling (Arnold, Load.: Introduction to Linear Regression A.: Introduction to Linear Regression	oury Belmont, 1996) York, 1998) ondon, 1998)			
		dle.hku.hk		, (),	,,		

STAT3602	Statistic	cal inference (6 credi	ts)	Academic Yea	r 2020	
Offering Department	Statistics	& Actuarial Science	•	Quota		
Course Co-ordinator	Prof S M	S Lee, Statistics & Actua	rial Science (smslee@hku.hk)			
Teachers Involved	(Prof S M	rof S M S Lee,Statistics & Actuarial Science)				
Course Objectives	mathema statistical	is course covers the advanced theory of point estimation, interval estimation and hypothesis testing. Using a thematically-oriented approach, the course provides a solid and rigorous treatment of inferential problems, tistical methodologies and the underlying concepts and theory. It is suitable in particular for students intending further their studies or to develop a career in statistical research.				
Course Contents & Topics	unbiasedi 2. Decisio 3. Estima estimator 4. Hypoth	ness; Bayes' rule. on problem - Bayesian ap ation theory: exponentia s; information inequality;	ist approach: loss function; risk proach: prior and posterior distribut I families; likelihood; sufficiency; large-sample theory of maximum lik nost powerful test; monotone likelihes set.	ions, Bayesian inference. minimal sufficiency; com celihood estimation.	pleteness; UMVU	
Course Learning	On succe	ssful completion of this c	ourse, students should be able to:			
Outcomes	CLO 1	form a panoramic view of	of classical developments in mather	natical statistics		
	CLO 2	gain thorough insight into	o the essentials of statistical inferer	ice		
	CLO 3	build a solid foundation t	for future research studies in statisti	cs and related areas		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	TAT2602 or STAT3902				
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20	22 : Y	Examination	Dec	
Grade Descriptors (A+ to F)	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar					
	and some unfamiliar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack					
	l an	of analytical and critical ab	ilities, logical and coherent thinking. Show presentational skills are minimally effective of	v very little or no ability to appl	y knowledge to solve	
Course Type	Lecture-b	ased course	•			
Course Teaching	Activitie	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents	Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3	
	Examina	tion	One 2-hour written examination	75	CLO 1,2,3	
Required/recommended reading and online materials	Bickel, P. Upper Sa Freund, J Hogg, R. Pace, L. Singapore	J. & Doksum, K. A.: M ddle River, N.J., 2001) . E.: Mathematical Statist V. & Craig, A. T.: Introdu & Salvan, A.: Principles e, 1997).	tistics: Theory and Methods (Duxbu athematical Statistics: Basic Ideas ics (Prentice Hall, Englewood Cliffs ction to Mathematical Statistics (Ma s of Statistical Inference: from a	and Selected Topics, Vol., N.J., 1992) cmillan, New York, 1989) neo-Fisherian perspective	. 1 (Prentice Hall,	
Course Website			ials of Statistical Inference (Cambri	uge University Press: Cam	bridge, ∠005).	
	nttn://mod	odle.hku.hk				

STAT3603	Stochastic processes (6 credits)	Academic Year	2020			
Offering Department	Statistics & Actuarial Science	Quota				
Course Co-ordinator	Dr J T Y Wong, Statistics & Actuarial Science (jefftywong@hku.hk)	Dr J T Y Wong, Statistics & Actuarial Science (jefftywong@hku.hk)				
Teachers Involved	(Dr J T Y Wong, Statistics & Actuarial Science)					
Course Objectives	This is an introductory course in stochastic processes.					
Course Contents & Topics	Introduction to probability theory, conditional probability and expectation, Markov chains, random walk models, classification of states in a Markov chain, calculation of limiting probabilities and mean time spent in transient states, Poisson process, distribution of inter-arrival time and waiting time, conditional distribution of the arrival time, Brownian Motion, hitting time and maximum variable, geometric Brownian motion, the Black-Scholes option pricing formula, Gaussian bridge, and stationary processes. Birth-and-death process, branching process and renewal process may also be covered (if time permits).					
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 apply the conditioning method to calculate the mean and probability CLO 2 understand the essentials of Markov chains, the Poisson process, and Brownian motion CLO 3 understand how stochastic models can be applied to the study of real-life phenomena					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in STAT2601; and Not for students who have passed in MATH3603, or have already enrolled in this course; and Not for students who have passed in STAT3903, or have already enrolled in this course.					
Offer in 2020 - 2021	Y 1st sem Offer in 2021 - 2022 : Y	Examination	Dec			
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive know	vledge and skills required for att	aining all the course			

(A+ to F)			trong analytical and critical abilities and log ide range of complex, familiar and unfam			
	В					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail	Demonstrate little or no evid of analytical and critical at	dence of command of knowledge and skills pilities, logical and coherent thinking. Sho presentational skills are minimally effective	required for attaining the course ow very little or no ability to ap		
Course Type	Lecture-ba	ased course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading /	Self study			100	
Assessment Methods and Weighting	Methods	·	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	nts	Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3	
	Examinati	on	One 2-hour written examination	75	CLO 1,2,3	
Required/recommended reading and online materials	S. M. Ross	s: Introduction to Probab	oility Models (9th edition)		,	
Course Website	http://moo	dle.hku.hk				

STAT3604	Design a	Design and analysis of experiments (6 credits) Academic Yea			r 2020		
Offering Department	Statistics	& Actuarial Science		Quota	23		
Course Co-ordinator	Dr D Y Zh	ang, Statistics & Actuar	ial Science (doraz@hku.hk)				
eachers Involved	(Dr D Y ZI	hang,Statistics & Actuar	rial Science)				
Course Objectives	basic prin	ientific research often requires proper design and analysis of experiments. This course aims to introduce the sic principles of experimental design; to explain the concepts and to develop the statistical skills in model-base alysis of experiment.					
Course Contents & Topics	randomise	ed block, crossed and	s for designing experiments. Analy I nested factorial structure. Balanced/random effects models.				
Course Learning	On succes	ssful completion of this	course, students should be able to:				
Outcomes	CLO 1 de	CLO 1 develop a conceptual understanding of experimental design					
	CLO 2 ac		statistical tools of experimental d	esign and the understand	ding to use then		
			mental designs for different problems				
	CLO 4 se	elect appropriate statisti	cal model and to know how to validat	te the model			
Pre-requisites and Co-requisites and Impermissible combinations)	Pass in S	TAT2602 or STAT3611	or STAT3902				
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2	022 : N	Examination	Dec		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and abilit to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. L of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to so problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-ba	ased course					
ourse Teaching	Activities	5	Details		No. of Hours		
Learning Activities	Lectures				36		
	Tutorials				12		
		/ Self study			100		
Assessment Methods nd Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mappin		
	Assignme	ents	Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3,4		
	Examinat	ion	One 2-hour written examination	75	CLO 1,2,3,4		
Required/recommended reading and online materials	D. R. Cox A. L. Edw G. A. Ferg	Assignments tutorials, and a class test) 25					

	R. L. Moson, R. F. Gungst, & J. L. Hess: Statistical Design and Analysis of Experiments (Wiley, 1989)	
Course Website	http://moodle.hku.hk	

	Quality (control and manage	ment (6 credits)	Academic Year	r 2020	
Offering Department	Statistics 8	& Actuarial Science	<u>'</u>	Quota		
Course Co-ordinator	TBC, Stati	istics & Actuarial Science	e ()	·		
Teachers Involved						
Course Objectives	course propresents a reliability, six-sigma,	ne successful control of quality in production is a matter of primary importance to a company's prosperity. The purse provides an overview of quality compromise which involves both the producer and the consumer. The esents a variety of statistical solutions including control charts, acceptance and sequential sampling plan diability, and life-testing. Contemporary quality management systems such as total quality control, zero defectively. The student is brought to the frontier of today's quality control anagement ideas.				
Course Contents & Topics	control, va sampling testing. E	ariables and attributes of plans. MIL-STD-105D	r applications, process variability, control charts. Operating characte and Dodge-Romig schemes. designs. Management of quality of	ristic curves. Single, doub Variables sampling. Re	ole and sequential liability and life	
Course Learning	On succes	ssful completion of this c	course, students should be able to:			
Outcomes	CLO 1 a	ppreciate the practicality	y of statistical concepts and method	pts and methods in general		
			fit various production situat	tions		
		CLO 3 know the traditional and modern systems of quality management				
Pre-requisites (and Co-requisites and Impermissible combinations)	course) or		0 and any University level 2 cours iniversity level 2 course) or STAT26			
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : N		Examination		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	С	Demonstrate general but in outcomes. Show evidence	ncomplete command of knowledge and sk of some analytical and critical abilities and	ntational skills. ills required for attaining most ological thinking, and ability to app	of the course learning	
	C D	Demonstrate general but in outcomes. Show evidence of familiar situations. Apply mo Demonstrate partial but limi Show evidence of some coh	ncomplete command of knowledge and sk of some analytical and critical abilities and	ntational skills. ills required for attaining most ological thinking, and ability to appational skills. red for attaining some of the cour halytical and critical abilities. Show	of the course learning oly knowledge to most rse learning outcomes.	
		Demonstrate general but in outcomes. Show evidence of familiar situations. Apply mo Demonstrate partial but limi Show evidence of some coh knowledge to solve problem Demonstrate little or no evidence of analytical and critical at	ncomplete command of knowledge and sk of some analytical and critical abilities and derately effective organizational and present ted command of knowledge and skills requil terent and logical thinking, but with limited ar	ntational skills. ills required for attaining most of logical thinking, and ability to appart attaining most of the council skills. red for attaining some of the council skills. Show on all and presentational skills. equired for attaining the course levery little or no ability to apply	of the course learning oly knowledge to most rse learning outcomes. v limited ability to apply arning outcomes. Lack	
	D Fail	Demonstrate general but in outcomes. Show evidence of familiar situations. Apply mo Demonstrate partial but limi Show evidence of some coh knowledge to solve problem Demonstrate little or no evidence of analytical and critical at	ncomplete command of knowledge and sk of some analytical and critical abilities and derately effective organizational and present ted command of knowledge and skills requil interest and logical thinking, but with limited are s. Apply limited or barely effective organization lence of command of knowledge and skills robilities, logical and coherent thinking. Show	ntational skills. ills required for attaining most of logical thinking, and ability to appart attaining most of the council skills. red for attaining some of the council skills. Show on all and presentational skills. equired for attaining the course levery little or no ability to apply	of the course learning oly knowledge to most rse learning outcomes. v limited ability to apply arning outcomes. Lack	
Course Teaching	D Fail Lecture-ba Activities	Demonstrate general but in outcomes. Show evidence can familiar situations. Apply mo Demonstrate partial but limi Show evidence of some co- knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and ased course	ncomplete command of knowledge and sk of some analytical and critical abilities and derately effective organizational and present ted command of knowledge and skills requil interest and logical thinking, but with limited are s. Apply limited or barely effective organization lence of command of knowledge and skills robilities, logical and coherent thinking. Show	ntational skills. ills required for attaining most of logical thinking, and ability to appart attaining most of the council skills. red for attaining some of the council skills. Show on all and presentational skills. equired for attaining the course levery little or no ability to apply	of the course learning oly knowledge to most rise learning outcomes. I limited ability to apply arning outcomes. Lack y knowledge to solve	
Course Teaching	D Fail Lecture-ba Activities Lectures	Demonstrate general but in outcomes. Show evidence can familiar situations. Apply mo Demonstrate partial but limi Show evidence of some co- knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and ased course	ncomplete command of knowledge and sk of some analytical and critical abilities and derately effective organizational and present ted command of knowledge and skills requirement and logical thinking, but with limited ars. Apply limited or barely effective organization lence of command of knowledge and skills relicities, logical and coherent thinking. Show presentational skills are minimally effective or the state of t	ntational skills. ills required for attaining most of logical thinking, and ability to appart attaining most of the council skills. red for attaining some of the council skills. Show on all and presentational skills. equired for attaining the course levery little or no ability to apply	of the course learning only knowledge to most rise learning outcomes. It is a considerable to apply arning outcomes. Lack y knowledge to solve	
Course Type Course Teaching & Learning Activities	D Fail Lecture-ba Activities Lectures Tutorials	Demonstrate general but in outcomes. Show evidence familiar situations. Apply mo Demonstrate partial but limi Show evidence of some coh knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and assed course	ncomplete command of knowledge and sk of some analytical and critical abilities and derately effective organizational and present ted command of knowledge and skills requirement and logical thinking, but with limited ars. Apply limited or barely effective organization lence of command of knowledge and skills relicities, logical and coherent thinking. Show presentational skills are minimally effective or the state of t	ntational skills. ills required for attaining most of logical thinking, and ability to appart attaining most of the council skills. red for attaining some of the council skills. Show on all and presentational skills. equired for attaining the course levery little or no ability to apply	of the course learning only knowledge to most rise learning outcomes. It is a learning outcomes. Lack y knowledge to solve No. of Hours 36 12	
Course Teaching & Learning Activities	D Fail Lecture-ba Activities Lectures Tutorials Reading /	Demonstrate general but in outcomes. Show evidence can familiar situations. Apply mo Demonstrate partial but limi Show evidence of some co- knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and ased course	ncomplete command of knowledge and sk of some analytical and critical abilities and derately effective organizational and present ted command of knowledge and skills requirement and logical thinking, but with limited ar s. Apply limited or barely effective organization ence of command of knowledge and skills relities, logical and coherent thinking. Show presentational skills are minimally effective or Details	ntational skills. ills required for attaining most of logical thinking, and ability to appational skills. red for attaining some of the counalytical and critical abilities. Show onal and presentational skills. equired for attaining the course le very little or no ability to apply or ineffective.	of the course learning only knowledge to most rise learning outcomes. Vimited ability to apply arning outcomes. Lacky knowledge to solve No. of Hours 36 12 100	
Course Teaching	D Fail Lecture-ba Activities Lectures Tutorials	Demonstrate general but in outcomes. Show evidence familiar situations. Apply mo Demonstrate partial but limi Show evidence of some coh knowledge to solve problem Demonstrate little or no evid of analytical and critical at problems. Organization and assed course	ncomplete command of knowledge and sk of some analytical and critical abilities and derately effective organizational and present ted command of knowledge and skills requirement and logical thinking, but with limited ar s. Apply limited or barely effective organization lence of command of knowledge and skills rollities, logical and coherent thinking. Show presentational skills are minimally effective of Details Details	ntational skills. ills required for attaining most of logical thinking, and ability to appart attaining most of the council skills. red for attaining some of the council skills. Show on all and presentational skills. equired for attaining the course levery little or no ability to apply	of the course learning only knowledge to most rise learning outcomes. It is a learning outcomes. Lack y knowledge to solve No. of Hours 36 12	
Course Teaching & Learning Activities Assessment Methods	D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme	Demonstrate general but in outcomes. Show evidence of familiar situations. Apply mo Demonstrate partial but limi Show evidence of some coh knowledge to solve problem. Demonstrate little or no evid of analytical and critical at problems. Organization and ased course	ncomplete command of knowledge and sk of some analytical and critical abilities and derately effective organizational and present ted command of knowledge and skills requirement and logical thinking, but with limited ars. Apply limited or barely effective organization of command of knowledge and skills repuirence of command of knowledge and skills rollities, logical and coherent thinking. Show presentational skills are minimally effective of the command of knowledge and skills. Details Details Coursework (assignments, tutorials, and a class test)	ntational skills. ills required for attaining most of logical thinking, and ability to appational skills. red for attaining some of the counalytical and critical abilities. Show anal and presentational skills. equired for attaining the course lever yell to apply or ineffective. Weighting in final course grade (%)	of the course learning obly knowledge to most rise learning outcomes. Variety of the course of the c	
Course Teaching & Learning Activities Assessment Methods and Weighting	Pail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati	Demonstrate general but in outcomes. Show evidence of familiar situations. Apply mo Demonstrate partial but limi Show evidence of some coh knowledge to solve problem. Demonstrate little or no evid of analytical and critical at problems. Organization and ased course 3 7 Self study	ncomplete command of knowledge and sk of some analytical and critical abilities and derately effective organizational and present ted command of knowledge and skills requirement and logical thinking, but with limited ar s. Apply limited or barely effective organization of command of knowledge and skills repuirence of command of knowledge and skills rollities, logical and coherent thinking. Show presentational skills are minimally effective of the command of knowledge and skills. Details Details Coursework (assignments, tutorials, and a class test) One 2-hour written examination	ntational skills. ills required for attaining most of logical thinking, and ability to appational skills. red for attaining some of the counalytical and critical abilities. Show anal and presentational skills. equired for attaining the course lever yell the or no ability to apply or ineffective. Weighting in final course grade (%) 25 75	of the course learning only knowledge to most rise learning outcomes. Variety arning outcomes. Lack y knowledge to solve No. of Hours 36 12 100 Assessment Methods to CLO Mapping	
Course Teaching & Learning Activities Assessment Methods and Weighting	Pail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati A. J. Duno D. C. Mon J. Banks: I E. L. Gran I. D. Hill: A G. B. Weti	Demonstrate general but in outcomes. Show evidence of familiar situations. Apply mo Demonstrate partial but limi Show evidence of some cohence of analytical and critical at problems. Organization and cased course of Self study Sents ion can: Quality Control and tagomery: Statistical Qua Principles of Quality Corut & R. S. Leavenworth: San Introduction to Sampl herill: Sampling Inspectic	ncomplete command of knowledge and sk of some analytical and critical abilities and derately effective organizational and present ted command of knowledge and skills requirement and logical thinking, but with limited ars. Apply limited or barely effective organization of command of knowledge and skills repuirence of command of knowledge and skills rollities, logical and coherent thinking. Show presentational skills are minimally effective of the command of knowledge and skills. Details Details Coursework (assignments, tutorials, and a class test)	ntational skills. ills required for attaining most of logical thinking, and ability to appational skills. red for attaining some of the courallytical and critical abilities. Show onal and presentational skills. required for attaining the course legal of the coural and presentational skills. required for attaining the course legal of the course legal of the course of the course of the course of the course grade (%) Weighting in final course grade (%) 25 75 or, 1986, 5th edition) 3rd edition) C: McGraw-Hill, 1988, 6th edition of the course of the c	of the course learning only knowledge to most rise learning outcomes. Vimited ability to apply arning outcomes. Lacky knowledge to solve No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3 dition)	

STAT3606	Business logistics (6 credits)	Academic Year	2020		
Offering Department	Statistics & Actuarial Science	Quota			
Course Co-ordinator	Dr O T K Choi, Statistics & Actuarial Science (ochoi@hku.hk)				
Teachers Involved	(Dr O T K Choi, Statistics & Actuarial Science)				
Course Objectives	Modern business corporations are increasingly using logistics as a management tool, for example, in capital budgeting problems, production planning, scheduling, transportations and deciding location for a new factory. This course addresses the business applications of logistics.				
Course Contents & Topics	In this course, students will apply the analytical skills with aid of computer logistic problems. Topics include optimization techniques applied in allocation transportation, assignment, inventory control and queuing problems.				
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 solve linear programming with Graphical approach, Simplex method an	d hands-on Excel \$	Solving function		
	CLO 2 set up and solve network flow problems using least-cost appro approximation.	ach, MODI metho	od and Vogel's		
	CLO 3 understand decision theory and its applications				
	CLO 4 evaluate the cost and effectiveness of service systems				
Pre-requisites (and Co-requisites	Pass in BIOL2102 or (ECON1280 and any University level 2 course) or (STAT1602 and any University level 2 course) or STAT2601 or (STAT2601				

and Impermissible combinations)	,	r STAT2901; and udents who have passed	MATH3901, or have already enrol	led in this course.		
Offer in 2020 - 2021		sem Offer in 2021 - 20		Examination	Dec	
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail	Demonstrate little or no evid of analytical and critical at	lence of command of knowledge and skills in bilities, logical and coherent thinking. Show presentational skills are minimally effective	required for attaining the course w very little or no ability to a		
Course Type	Lecture-ba	ased course	·			
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading /	/ Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents	Coursework (assignments, tutorials and a test)	25	CLO 1,2,3,4	
	Examinat	ion	One 2-hour written examination	75	CLO 1,2,3,4	
Required/recommended	B. Render	r, R. Stair, M. Hanna: Qu	iantitative Analysis for Managemen	t, 10th edition, Pearson		
reading and	Wayne L.	Winston: Operations Re	search, 4th edition, Thomson Learn	ning		
online materials			tions Research, 8th edition, Pearso			
		•	in Introduction to Operations Resea			
			art and Winston: Introduction to Lir	near Algebra		
Course Website	nttp://moo	dle.hku.hk				

STAT3607	Statistic credits)		ine and bio-medical research (6	Academic Ye	2020	
Offering Department	Statistics	Statistics & Actuarial Science Quota				
Course Co-ordinator	Prof G Yi	n, Statistics & Actuarial	Science (gyin@hku.hk)			
Teachers Involved	(Prof G Y	in,Statistics & Actuarial	Science)			
Course Objectives	the clinic designs. size and	n clinical research, medical data are often observed which motivates the application of statistical methodology the clinical observational and decision-making process. Also, statistical problems often arise from clinical tridesigns. It involves phase I, II, III and IV clinical trial designs, both Bayesian and frequentist approaches, samy size and power calculation. No knowledge in biology or medicine is assumed; the course provides the necessation background when the statistical problems are introduced.				
Course Contents & Topics	analysis,	The contents of the course include contingency tables, regression models, survival analysis, categorical data analysis, Bayesian designs, dose-finding methods, sample size and power calculation, phase I, II and III tridesigns, hypothesis testing, adaptive designs.				
Course Learning	On succe	essful completion of this	course, students should be able to:			
Outcomes	CLO 1	understand the bas	sic concepts in medical statistics			
	CLO 2	design clinical trials	s and compute sample sizes			
	CLO 3	conduct statistical i	nference and apply regression models	3		
	CLO 4	solve medical probl	lems by using various statistical tests			
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	N Of	fer in 2021 - 2022 : N		Examination		
Grade Descriptors	A		astery at an advanced level of extensive know		attaining all the course	
(A+ to F)	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	В	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail	of analytical and critical	ridence of command of knowledge and skills re abilities, logical and coherent thinking. Show id presentational skills are minimally effective or	very little or no ability to ap		
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	5	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
			Coursework (assignments,			

	Assignments	tutorials, and a class test)	25	CLO 1,2,3,4		
	Examination	One 2-hour written examination	75	CLO 1,2,3,4		
Required/recommended reading and online materials	 J. Aitchison, J. W. Kay & I. J. Lauder: Statistical Concepts and Applications in Clinical Medicine (Ch Hall/CRC, 2004) J. Aitchison & J. Dunsmore: Statistical Prediction Analysis (Cambridge University Press, 1976) P. Armitage: Statistical Methods in Medical Research (Oxford: Blackwell, 1971) P. Armitage: Sequential Medical Trials (Oxford: Blackwell, 1975, 2nd edition) D. Altman: Practical Statistics for Medical Research (London: Chapman & Hall, 1991) N. E. Breslow & N. E. Day: Statistical Methods in Cancer Research Volume 1 - The analysis of case-cont (Lyon: IARC, 1980) D. R. Cox & E. J. Snell: The Analysis of Binary Data (London: Chapman and Hall, 1989, 2nd edition) D. R. Cox & D. V. Hinkley: Theoretical Statistics (London: Chapman and Hall, 1974) 					
Course Website	http://moodle.hku.hk					
Additional Course Information	B. Jones & M. G. Kenward: Desi B. J. T. Morgan: Analysis of Qua S. J. Pocock: Clinical Trials. A P	ship Analysis for Clinical Studies (New gn and Analysis of Cross-Over Trials ntal Response Data (London: Chapm Practical Approach (Chickestes: John I neralised Linear Models (London: Cha	(London: Chapman and H an and Hall, 1992) Wiley & Sons, 1991)	all, 1990)		

Course Co-ordinator Teachers Involved Course Objectives Course Contents & Topics Course Learning Outcomes Course Learning Outcomes CLO CLO Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Prof T Pr	T W K Fung, Statistics & Actu- course aims to provide stude tic epidemiology in gene map sic DNA and genetic problem course will cover the follow the foll	ents with a fundamental knowledge pping and to understand how statisins. wing topics: background of genetichi-square test; likelihood ratio test; ded stain; relatedness; population signalysis; linkage disequilibrium; asso	cs; Mendelian inheritance exact test; match probabil gructure; gene mapping; ociation designs; case-cor	are applied to solve e; Hardy-Weinberg ity; paternity testing parametric linkage ntrol analysis; family		
Teachers Involved Course Objectives Course Contents & Topics Course Learning Outcomes Course Learning Outcomes CLO CLO CLO Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors Course Learning On su CLO CLO CLO CLO	T W K Fung, Statistics & Actu- course aims to provide stude tic epidemiology in gene map sic DNA and genetic problem course will cover the follow the foll	uarial Science) ents with a fundamental knowledge pping and to understand how statist ns. wing topics: background of geneti- chi-square test; likelihood ratio test; of d stain; relatedness; population si- analysis; linkage disequilibrium; asso- tive traits. course, students should be able to: tal principles in statistical DNA foren possible limitations of statistical me	cs; Mendelian inheritance exact test; match probabil gructure; gene mapping; ociation designs; case-cor	are applied to solve e; Hardy-Weinberg ity; paternity testing parametric linkage ntrol analysis; family		
Course Objectives Course Contents & Topics This capulation in the course contents This capulation is contented in the course	course aims to provide stude tic epidemiology in gene mapsic DNA and genetic problem course will cover the follow brium; linkage equilibrium; cikinship analysis; DNA mixesis; non-parametric linkage at association study; quantitat accessful completion of this continuous to the fundamental complete to the funda	ents with a fundamental knowledge pping and to understand how statistins. wing topics: background of genetichi-square test; likelihood ratio test; ded stain; relatedness; population stanalysis; linkage disequilibrium; assotive traits. course, students should be able to: tal principles in statistical DNA forent possible limitations of statistical metals.	cs; Mendelian inheritance exact test; match probabil gructure; gene mapping; ociation designs; case-cor	are applied to solve e; Hardy-Weinberg ity; paternity testing parametric linkage ntrol analysis; family		
Course Contents & Topics Course Learning Outcomes CLO CLO Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors Course Learning On su CLO CLO CLO Ress A	tic epidemiology in gene mapsic DNA and genetic problem course will cover the follow brium; linkage equilibrium; cinship analysis; DNA mixesis; non-parametric linkage at association study; quantitat accessful completion of this continuous to a understand the fundamental know the usefulness and mapping a provide statistical solutions in STAT2602 or STAT3902	pping and to understand how statistins. wing topics: background of genetichi-square test; likelihood ratio test; or atain; relatedness; population stanalysis; linkage disequilibrium; assotive traits. course, students should be able to: tal principles in statistical DNA forent possible limitations of statistical me	cs; Mendelian inheritance exact test; match probabil gructure; gene mapping; ociation designs; case-cor	are applied to solve e; Hardy-Weinberg ity; paternity testing parametric linkage ntrol analysis; family		
& Topics equilit and k analyst based Course Learning On su CLO CLO CLO Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 N Grade Descriptors A	brium; linkage equilibrium; cl kinship analysis; DNA mixe sis; non-parametric linkage a d association study; quantitat accessful completion of this c 1 understand the fundament 2 know the usefulness and mapping 3 provide statistical solutions in STAT2602 or STAT3902	chi-square test; likelihood ratio test; ded stain; relatedness; population stanalysis; linkage disequilibrium; assettive traits. course, students should be able to: tal principles in statistical DNA forent possible limitations of statistical me	exact test; match probabil tructure; gene mapping; ociation designs; case-cor sics and genetic epidemic	ity; paternity testing parametric linkage ntrol analysis; family ology		
Outcomes CLO CLO CLO Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors A	understand the fundament know the usefulness and mapping provide statistical solutions in STAT2602 or STAT3902 Offer in 2021 - 2022: N	tal principles in statistical DNA foren possible limitations of statistical me				
CLO CLO CLO Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors A	2 know the usefulness and mapping 3 provide statistical solutions in STAT2602 or STAT3902 Offer in 2021 - 2022 : N	possible limitations of statistical me				
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 N Grade Descriptors A	Offer in 2021 - 2022 : N					
Grade Descriptors A						
•	Demonstrate thorough mas		Examination			
	learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
В	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
С	outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
D	Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
Fail	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type Lectu	re-based course					
Course Teaching Activ	/ities	Details		No. of Hours		
& Learning Activities Lectu	ıres			36		
Tutor				12		
Read	ling / Self study			100		
Assessment Methods and Weighting Meth	ods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	gnments	Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3		
	nination	One 2-hour written examination	75	CLO 1,2,3		
reading and Ott, J. online materials Ziegle Evett,	.: Analysis of Human Genetic er, A. and Konig, I.R.: A Stati , I. W. and Weir, B. S.: Interp	.: Essentials of Genetics (Prentice H. c Linkage (The Johns Hopkins Universitical Approach to Genetic Epidemic preting DNA Evidence (Sinauer Associal DNA Forensics: Theory, Methocial DNA Forensics: Theory, Methoc	ersity Press, 1999, 3rd ed. blogy (Wiley-VCH, 2006) ciates, Inc. Publishers, 19	98)		
Course Website http://	, vv. 17. and nu, n. W Olalist	aoai biya i oronoios. Theory, Welliot	is and Computation (Wile)	,, Jusson, 2000)		

STAT3609	The statistics of investment risk (6 credits)	Academic Year	2020				
Offering Department	Statistics & Actuarial Science	Quota					
Course Co-ordinator	Dr K P Wat, Statistics & Actuarial Science (watkp@hku.hk)	Dr K P Wat, Statistics & Actuarial Science (watkp@hku.hk)					
Teachers Involved	(Dr K P Wat,Statistics & Actuarial Science)						
Course Objectives	Most investments involve some risk. The decision to invest or not is usuall	y made against a	a background of				

	uncertainty. Whilst prediction of the future is difficult, there are statistical modelling techniques which provide a rational framework for investment decisions, particularly those relating to stock markets and the markets for interest rates, commodities and currencies. Building upon research, both in Hong Kong and abroad, this course presents the prevailing statistical theories for prices and price-change in these vital markets.					
Course Contents			an-variance portfolio theory, capital	asset pricing model, arbi	trage pricing theory,	
& Topics Course Learning			ement, behavioural finance. course, students should be able to:			
Outcomes		easure risk and return of	•			
Outcomes			s in constructing optimal investment	portfolios		
			icing models and evaluate investme			
	CLO 4 ex		market efficiency and apply approp	•	to assess different	
Dro roquioitos		,				
Pre-requisites (and Co-requisites		「AT2602, or already enr	ersity level 2 course) or STAT3611 c	or STAT3614: and		
and Impermissible			l in FINA2320, or have already enrol			
combinations)		c(Actuarial Science) stu				
Offer in 2020 - 2021		sem Offer in 2021 - 20		Examination	Dec	
Grade Descriptors (A+ to F)	A	Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a wi presentational skills.	tery at an advanced level of extensive kno trong analytical and critical abilities and logic ide range of complex, familiar and unfamili	owledge and skills required for al thinking, with evidence of ori ar situations. Apply highly effe	ginal thought, and ability ctive organizational and	
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the of analytical and critical abilities, logical and coherent thinking. Show very little or no ability problems. Organization and presentational skills are minimally effective or ineffective.						
		of analytical and critical at problems. Organization and	pilities, logical and coherent thinking. Show	equired for attaining the course very little or no ability to ap		
		of analytical and critical ab	pilities, logical and coherent thinking. Show	equired for attaining the course very little or no ability to ap	ply knowledge to solve	
Course Teaching		of analytical and critical ab problems. Organization and ased course	pilities, logical and coherent thinking. Show	equired for attaining the course very little or no ability to ap	No. of Hours	
Course Teaching	Lecture-ba Activities Lectures	of analytical and critical ab problems. Organization and ased course	oilities, logical and coherent thinking. Show presentational skills are minimally effective o	equired for attaining the course very little or no ability to ap	No. of Hours	
Course Teaching	Lecture-ba Activities Lectures Tutorials	of analytical and critical at problems. Organization and ased course	oilities, logical and coherent thinking. Show presentational skills are minimally effective o	equired for attaining the course very little or no ability to ap	No. of Hours 36 12	
Course Teaching & Learning Activities	Lecture-ba Activities Lectures Tutorials Reading /	of analytical and critical ab problems. Organization and ased course	oilities, logical and coherent thinking. Show presentational skills are minimally effective of Details	equired for attaining the course very little or no ability to ap or ineffective.	No. of Hours	
Course Teaching & Learning Activities Assessment Methods	Lecture-ba Activities Lectures Tutorials	of analytical and critical at problems. Organization and ased course	pilities, logical and coherent thinking. Show presentational skills are minimally effective of the company of the control of t	equired for attaining the course very little or no ability to ap	No. of Hours 36 12	
Course Teaching & Learning Activities Assessment Methods	Lecture-ba Activities Lectures Tutorials Reading /	of analytical and critical at problems. Organization and ased course Self study	oilities, logical and coherent thinking. Show presentational skills are minimally effective of Details	equired for attaining the course very little or no ability to ap or ineffective. Weighting in final	No. of Hours 36 12 100 Assessment Methods	
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Tutorials Reading / Methods	of analytical and critical at problems. Organization and ased course Self study	Details Details Coursework (assignments,	equired for attaining the course of very little or no ability to apor ineffective. Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping	
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati Bodie, Z., Elton, E. J. Analysis (& Luenberge Defusco, If Institute In Fabozzi, F Cointegrat	of analytical and critical at problems. Organization and ased course Self study Self study Marcus, A. J., Gruber, M. J., Brown Bth Edition). John Wiley. R. A., McLeavey, D. W. vestment Series (2nd E. J., Focardi, S. M., an ion. New Jersey: Wiley.	Details Details Coursework (assignments, tutorials and class test(s)) One 2-hour written examination and Jain, R. (2014). Investments (A., S. J., and Goetzmann, W. N. (2014). Pinto, J. E., and Runkle D. E. (2 dition). New Jersey: Wiley. d Kolm, P. N. (2006). Financial Mc. (2006). Financial Mc. (2006). Financial Mc. (2006).	weighting in final course grade (%) Weighting in final course grade (%) 40 60 sia Global Edition). McGr. 11). Modern Portfolio The Oxford University Press. 007). Quantitative Investing delling of the Equity Mar.	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4 aw-Hill. eory and Investment ment Analysis, CFA	

STAT3610	Risk management and insurance (6 credits)	Academic Year	2020				
Offering Department	Statistics & Actuarial Science	Quota					
Course Co-ordinator	Dr R W L Wong, Statistics & Actuarial Science (rwong @hku.hk)						
Teachers Involved	(Dr R W L Wong, Statistics & Actuarial Science)						
Course Objectives	This course provides knowledge on basic risk and its management, as well as basic financial planning through insurance products, to students. It allows students to understand the statistical, financial and legal principles underlying the techniques for managing the insurable risks faced by organisations and individuals. This course aims at students who have minimal background in quantitative methods, it involves very minimal quantitative calculations.						
Course Contents & Topics	The course introduces and explains: - risk in our society, - insurance and risk, - introduction to risk management, - fundamental legal principles, and analysis of insurance contracts, - life insurance, their contractual provisions,						
Course Learning Outcomes	 - individual health insurance coverages. On successful completion of this course, students should be able to: CLO 1 understand the general risks faced by organisations and individuals and the generic risk management principle CLO 2 demonstrate knowledge and understanding of the underlying financial and legal principles of the insurance industry CLO 3 understand how risk can be managed through insurance CLO 4 compare and contrast different types of commercial and personal insurance products CLO 5 plan for and arrange their own personal insurance needs 						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOL2102 or (ECON1280 and any University level 2 course) or (STAT1601 and any University level 2 course) or (STAT1602 and any University level 2 course) or STAT2601 or (STAT1603 and any University level 2 course) or STAT2901. (Not available to Actuarial Science students)						

Offer in 2020 - 2021	Y 2n	d sem Offer in 2021 -	2022 : N	Examination	May				
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.							
	В	learning outcomes. Show e	ommand of a broad range of knowledge an evidence of analytical and critical abilities and ons. Apply effective organizational and prese	l logical thinking, and ability to ap					
	С								
	D	Show evidence of some co	nited command of knowledge and skills requester and logical thinking, but with limited and sample limited or barely effective organiza	analytical and critical abilities. Sh					
	Fail	of analytical and critical a	idence of command of knowledge and skills abilities, logical and coherent thinking. Sho d presentational skills are minimally effective	w very little or no ability to ap					
Course Type	Lecture-l	pased course	· · · · · · · · · · · · · · · · · · ·						
Course Teaching	Activities		Details	No. of Hours					
& Learning Activities	Lectures	3		36					
	Tutorials	3			12				
	Reading	/ Self study		100					
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping				
	Assignm	nents	Coursework (assignments, tutorials, and a class test)	25	CLO 1,3				
	Examina	ation	One 2-hour written examination	75	CLO 1,2,3,4,5				
Required/recommended reading and	Trieschm	ejda, G. E.: Principles of Risk Management and Insurance (Pearson Addison Wesley, 10th edition) ieschmann, J., Hoyt, R. E. and Sommer, D.: Risk Management and Insurance (South-Western, 2005, 12th							
online materials	edition)	odle.hku.hk		,					
Course Website									

STAT3611	Comput	ter-aided data a	ınalysis (6 credits)		Academic Yea	r 2020	
Offering Department	Statistics	& Actuarial Science	e ,		Quota		
Course Co-ordinator	Dr E K F I	Lam, Statistics & A	Actuarial Science (hrntlkf@hku.hk))			
Teachers Involved							
Course Objectives	scientific several v statistics. statistics.	A wide range of statistical analyses and methods are presented using data sets from social sciences research and scientific studies. Measuring uncertainty, describing patterns of variability and the inter-relationship between several variables are essential aspects of scientific investigations that require good understanding of statistics. This computer-oriented but non-mathematical course develops the important concepts and methods of statistics. The course makes extensive use of computers through the user friendly statistical software JMP. No knowledge of a programming language is required.					
Course Contents & Topics		lata exploration, formulation of testable hypotheses, the evaluation of evidence and forecasting on the basis of ast experience.					
Course Learning	On succe	ssful completion o	f this course, students should be a	able to:			
Outcomes	CLO 1 st	CLO 1 summarize and describe the quantitative and qualitative data using some simple statistical measures					
		escribe the patter ariables	ns of variability and the inter-re	elationship betwe	en several contir	nuous or discrete	
			atistical analyses based on some al inferences and make interpretat			hypotheses, make	
Pre-requisites (and Co-requisites and Impermissible combinations)	course) o	Pass in BIOL2102 or (ECON1280 and any University level 2 course) or (STAT1601 and any University level 2 course) or (STAT1602 and any University level 2 course) or (STAT1603 and any University level 2 course); and Not for students who have passed in or have already enrolled in any of these courses: STAT2601, STAT2901 STAT3616					
Offer in 2020 - 2021	N Off	fer in 2021 - 2022	: N		Examination		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar						
	С	outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most					
	D	Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply					
	Fail	Demonstrate little or of analytical and co	problems. Apply limited or barely effective no evidence of command of knowledge a itical abilities, logical and coherent think ion and presentational skills are minimally	and skills required for king. Show very little	attaining the course le or no ability to app		
Course Type	Lecture-b	ased course					
Course Teaching	Activities	s	Details	Details			
& Learning Activities	Lectures						
	Tutorials					12	
	Reading	/ Self study				100	
Assessment Methods and Weighting	Methods	•	Details		ghting in final rse grade (%)	Assessment Methods to CLO Mapping	
	Assignments		Coursework (assignme practical work, and a term	,	40	CLO 1,2,3	
	Examinat	tion	One 2-hour written examir	nation	60	CLO 1,2,3	
Required/recommended reading and	G. C. Car	navos & D. M. Mille	One 2-hour written examir er: An Introduction to Modern Busi of Social Research (Wadsworth Po	ness Statistics (D	Ouxbury Press, 19	/ /-	

online materials	J. E. Freund & G. A. Simon: Statistics - A First Course (Prentice Hall, 7th edition) R. Hooke: How to tell the liars from the Statisticians (Marcel Dekker) D. G. Kleinbaum, L. L. Kupper, & K. E. Muller: Applied Regression Analysis and Other Multivariable Methods (Duxbury Press, 1988, 2nd edition) D. M. Levine, M. L. Berenson, & D. Stephan: Statistics for Managers - Using Microsoft Excel (Prentice Hall, 2nd edition)
Course Website	http://moodle.hku.hk
Additional Course Information	CogSc or CompSc students having taken STAT1301 should obtain approval from the dept. Other reference: J. T. McClave & F. H. Dietrich II: Statistics (Maxwell Macmillian, 5th ed.) M. R. Middleton: Data Analysis Using Microsoft EXCEL 5.0 (Duxbury) J. Neter, W. Wasserman, & G. A. Whitmore: Applied Statistics (Allyn and Bacon) P. Newbold: Statistics for Business and Economics (Prentice-Hall, International Editions, 3rd ed.) I. Olkin, L. J. Gleser, & C. Derman: Probability Models and Applications (Prentice-Hall, 2nd ed.) J. G. Peatman: Introduction to Applied Statistics (Harper)

STAT3612	Statistic	al machine learning	(6 credits)	Academic Ye	ar 2020			
Offering Department		& Actuarial Science	,	Quota				
Course Co-ordinator	Dr A J Zha	ang, Statistics & Actuaria	al Science (ajzhang@hku.hk)		'			
Teachers Involved	(Dr A J Zh	ang,Statistics & Actuaria	al Science)					
Course Objectives	predictions methodolo essential	Machine learning is the study of computer algorithms that build models of observed data in order to make predictions or decisions. Statistical machine learning emphasizes the importance of statistical theory and methodology in the algorithmic development. This course provides a comprehensive and practical coverage of essential machine learning concepts and a variety of learning algorithms under supervised and unsupervised settings. The course materials are presented with lots of examples and reproducible codes.						
Course Contents & Topics	Data scie	lata science, data exploration, generalized linear models, variable selection, basis expansion, regularization, ross-validation, tree-based methods, kernel methods, neural networks, dimension reduction, principal component nalysis, cluster analysis, stochastic optimization, interpretable machine learning.						
Course Learning Outcomes	On succes CLO 1 ge CLO 2 un ch	On successful completion of this course, students should be able to: CLO 1 get familiar with the workflow of a data science or machine learning project CLO 2 understand and apply a wide range of statistical machine learning methods, and recognize thei characteristics, strengths and weaknesses CLO 3 identify and use appropriate techniques for a particular data science project						
			resulting model in terms of predicting for solving data-scientific problems		plainability			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in ST Pass in ST Not for stu Not for BS	CLO 5 apply R/Python programming for solving data-scientific problems Pass in STAT2602 or (STAT1603 and any University level 2 course) or STAT3902; and Pass in STAT3600 or STAT3907, or already enrolled in these courses; and Not for students who have passed in STAT4904, or already enrolled in this course; and Not for BSc(Actuarial Science) students. 3Sc(Actuarial Science) students are advised to take STAT4904 Statistical learning for risk modelling instead.						
Offer in 2020 - 2021		,		Examination	No Exam			
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the coulearning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational apresentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the coulearning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to fam and some unfamiliar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learn outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to m familiar situations. Apply moderately effective organizational and presentational skills. D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. L of analytical and critical abilities, logical and coherent thinking, Show very little or no ability to apply knowledge to so							
Course Type	Lecture-ha	ased course	presentational skills are minimally effective	of menecuve.				
Course Teaching	Activities		Details		No. of Hours			
& Learning Activities	Lectures		Details		36			
Jag . toti 111100	Tutorials				12			
		Self study			100			
Assessment Methods and Weighting	Methods	22 0	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignme	ents		30	CLO 1,2,3,5			
	Project re	ports		30	CLO 1,2,3,4,5			
	Test			40	CLO 2,3			
Required/recommended reading and online materials	Application 2. Hastie, and Predict 3. Geron, Technique	James, G., Witten, D., Hastie, T. and Tibshirani, R. (2013). An Introduction to Statistical Learning with pplications in R, Springer, New York. Hastie, T., Tibshirani, R. and Friedman, J. (2009). The Elements of Statistical Learning: Data Mining, Inference, and Prediction. Second Edition, Springer, New York. Geron, A. (2017). Hands-On Machine Learning with Scikit-Learn and TensorFlow: Concepts, Tools, and echniques to Build Intelligent Systems. O'Reilly.						
Course Website	http://moo		8). Deep Learning with R. Manning	y.				
Course website	mup.//11100	ule.HKU.HK						

STAT3613	Marketing analytics (6 credits)	Academic Year	2020
Offering Department	Statistics & Actuarial Science	Quota	50
Course Co-ordinator	Dr C W Kwan, Statistics & Actuarial Science (cwkwan@hku.hk)		

Teachers Involved	(Dr C W Kwan, Statistics & Actuarial Science)						
Course Objectives	used in the and report including	This course is designed to provide an overview and practical application of trends, technology and methodology used in the marketing survey process including problem formulation, survey design, data collection and analysis, and report writing. Special emphasis will be put on statistical techniques particularly for analysing marketing data including market segmentation, market response models, consumer preference analysis and conjoint analysis. Students will analyse a variety of marketing case studies.					
Course Contents & Topics	,	arketing decision models, Market response models, Survey research, Statistical methods for segmentation, atistical methods for positioning, Statistical methods for new product design					
Course Learning Outcomes	CLO 1 d CLO 2 u CLO 3 u a	On successful completion of this course, students should be able to: CLO 1 develop hands-on skills of curve fitting and analyzing data with SAS procedures or R packages CLO 2 understand marketing decision models CLO 3 understand cluster analysis, factor analysis, multidimensional scaling, correspondence analysis, conjoi analysis, choice models, confirmatory factor analysis, and discriminant analysis in market segmentatio positioning and new product design					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	BIOL2102 or (ECON128	30 and any University level 2 course University level 2 course) or STAT26				
Offer in 2020 - 2021	Y 1st	t sem Offer in 2021 - 20	022 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	of analytical and critical a	dence of command of knowledge and skills re bilities, logical and coherent thinking. Show I presentational skills are minimally effective of	very little or no ability to ap			
Course Type	Lecture-b	ased course	·				
Course Teaching	Activitie	s	Details		No. of Hours		
& Learning Activities	Lectures			36			
	Tutorials				12		
	-	/ Self study			100		
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		Coursework (assignments, a class test and a group project)	50	CLO 1,2,3		
	Examina	tion	One 2-hour written examination	50	CLO 1,2,3		
Required/recommended reading and online materials	Malhotra, Johnson	Lattin J., Carroll J.D. and Green P.E.: Analysing multivariate data (Thomson) Malhotra, Naresh: Marketing Research: An Applied Orientation (Pearson, 2010, 6th ed.) Johnson R., Wichern D.: Applied Multivariate Statistical Analysis (Prentice Hall, 5th ed.) Lilien G.L. and Rangaswamy A.: Marketing Engineering (Prentice Hall, 2003, 2nd ed.)					
		odle.hku.hk	J =g	, - <i>,</i>			

STAT3614	Business	s forecasting (6 credits)	Academic Year	2020					
Offering Department	Statistics 8	Actuarial Science	Quota						
Course Co-ordinator	Dr R W L V	Dr R W L Wong, Statistics & Actuarial Science (rwong @hku.hk)							
Teachers Involved									
Course Objectives	individual forecasts f	In daily business operations, forecasts are routinely required on different aspects of the economy, the market and individual companies. Numerous statistical techniques have been developed in the past decades to provide forecasts for the business decision-maker. This course considers a wide range of such techniques that have proven useful to practitioners. The course will involve the use of computer software, EXCEL, in the teaching process.							
Course Contents & Topics	averages	Review of basic statistical concepts; autocorrelation analysis; evaluation and combination of forecasts; moving averages and smoothing methods; simple linear regression; multiple regression; growth curves; time series regression; the handling of seasonal cycles; decomposition methods.							
Course Learning	On succes	sful completion of this course, students should be able to:							
Outcomes	CLO 1 understand data patterns and choose a suitable forecasting techniques								
	CLO 2 understand forecasting methods: moving averages and smoothing methods, decomposition and winter's methods, simple and multiple linear regression								
	CLO 3 develop hands-on skills of analyzing business data with computer software, EXCEL, and its add-ins functions								
Pre-requisites (and Co-requisites and Impermissible combinations)	course) or Not for stu	OL2102 or (ECON1280 and any University level 2 course) or (STAT1602 and any University level 2 course) or (STAT1603 and a dents who have passed or already enrolled in any of these courses, ECON2280.	ny University level 2	2 course); and					
Offer in 2020 - 2021	N Offe	r in 2021 - 2022 : N	Examination						
Grade Descriptors (A+ to F)	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.							
	В								
	С	11.7 9							

	familiar situations. Ap	familiar situations. Apply moderately effective organizational and presentational skills.						
	Show evidence of so	Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited a knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	of analytical and cri							
Course Type	Lecture-based course							
Course Teaching	Activities	Details		No. of Hours				
& Learning Activities	Lectures			36				
	Tutorials			12				
	Reading / Self study			100				
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping				
	Assignments	Coursework (assignments, tutorials, and a class test)	40	CLO 1				
	Examination	One 2-hour written examination	60	CLO 1,2,3				
Required/recommended reading and online materials	J. E. Hanke, D. W. Wichern, & A. G. Reitsch: Business Forecasting (Prentice Hall, 2009, 9th ed.) P. E. Gaynor & R. C. Kirkpatrick: Introduction to Time-series Modelling and Forecasting in Business a Economics (McGraw-Hill, 1994) P. Newbold & T. Bos: Introductory Business & Economic Forecasting (ITP, 1994)							
Course Website	http://moodle.hku.hk	· ·						
Additional Course Information		lso available to CompSc students having taken STAT1301. Students should obtain approval from the course oordinator before choosing this course.						

OT 4 TO 64 F	D 4!	l 4l 4!		Practical mathematics for investment (6 credits) Academic Year 2020					
STAT3615			•	dits)		ar 2020			
Offering Department		& Actuarial Science			Quota				
Course Co-ordinator			& Actuarial Science (bend	chi@hku.hk)					
Teachers Involved			& Actuarial Science)						
Course Objectives	concepts a	The main focus of this course is built on the concepts on financial mathematics. Practical applications of thes concepts are also considered.							
Course Contents & Topics	schedules	This course covers: simple and compound interest; annuities certain; discounted cash flow analysis; amortization schedules and sinking funds; yield rates; bonds and related securities; practical applications such as real estate mortgage, short sales and term structure of interest rates.							
Course Learning	On succes	successful completion of this course, students should be able to:							
Outcomes	CLO 1 sc	olve practical proble	ms relating to annuities of	ertain, simple a	nd compound interest				
	CLO 2 ca	arry out discounted	cash flow analysis						
	CLO 3 ap	oply amortization so	hedules and sinking fund	ls to the practica	al problems such as real e	estate mortgage			
Pre-requisites			y University level 2 cou			level 2 course) or			
(and Co-requisites	STAT260	1 or (STAT1603 and	d any University level 2 co	ourse) or STAT2	2901; and				
and Impermissible combinations)	Not for stu	idents who have pa	ssed in STAT2902, or ha	ve already enro	lled in this course.				
Offer in 2020 - 2021	Y 2nd	sem Offer in 202	11 - 2022 : Y		Examination	May			
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course								
	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning								
	outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes.								
	Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.								
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.								
Course Type	Lecture-ba	ased course							
Course Teaching	Activities	3	Details			No. of Hours			
& Learning Activities	Lectures					36			
	Tutorials					12			
	Reading /	Self study				100			
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments		Coursework (as tutorials, and a class	ssignments, ss test)	25	CLO 1,2,3			
	Examinat	ion	One 3-hour written	examination	75	CLO 1,2,3			
Required/recommended reading and online materials		n, S. A.: Mathemat	f Interest (Irwin: Illinois, 2 ics of Investment and C			Books: Connecticut			
Course Website	-	dle.hku.hk							

STAT3616	Advanced SAS programming (6 credits)	Academic Year	2020
Offering Department	Statistics & Actuarial Science	Quota	50
Course Co-ordinator	TBC, Statistics & Actuarial Science ()		
Teachers Involved			
Course Objectives	This course aims to equip students, who have taken STAT2603, with a programming for automation of procedures and data processing in solving comp		

Course Contents & Topics	Overview of SAS underlying parts. Macro programming. Advanced programming techniques including data simulation, advanced data look-up techniques, modifying transaction datasets and controlling I/O processing and memory.							
Course Learning	On successful completion of this course, students should be able to:							
Outcomes	CLO 1 l	Jnderstand the system o	f SAS and basic programming					
		•	parallel processing to aid automati	on				
			ithout printing to OUTPUT windows		ition			
			elop customized and automated ap					
	CLO 5 Use advanced SAS programming statements and techniques to solve complex problems							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in STAT2601 or STAT2901 (Students are strongly recommended to take STAT2603 or STAT2604 prior to taking this course.)							
Offer in 2020 - 2021	N Off	er in 2021 - 2022 : N		Examination				
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.							
	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.							
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.							
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.							
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.							
Course Type	Lecture-based course							
Course Teaching	Activities Details			No. of Hours				
& Learning Activities	Lectures				36			
	Tutorials				12			
	Reading	/ Self study			100			
Assessment Methods and Weighting	Methods	·	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments		Coursework (assignments, tutorials, and a class test)	50	CLO 1,2,3,4,5			
	Examination One 2-hour written examination 50		CLO 1,2,3,4,5					
Required/recommended	SAS Certification Prep Guide: Advanced Programming for SAS 9, Third Edition.							
reading and	Carpenter, A.: Carpenters Complete Guide to the SAS Macro Language. Second Edition. (North Carolina: SAS							
online materials	Institute Inc., 2004)							
Course Website	http://moodle.hku.hk							

STAT3617	Sample	survey me	thods (6 credi	its)		Academic Year	2020		
Offering Department	Statistics	& Actuarial S	cience			Quota			
Course Co-ordinator	Ms O T K Choi, Statistics & Actuarial Science (ochoi@hku.hk)								
Teachers Involved	(Ms O T K Choi, Statistics & Actuarial Science)								
	(Prof F W H Ho, Statistics & Actuarial Science)								
Course Objectives	This course will cover design and implementation of sample surveys and analysis of statistical data thus obtained Survey design includes overall survey design, design of sampling schemes and questionnaires, etc. Sampling methods include sample size determination, sampling and non-sampling errors and biases, methods of estimation of parameters from survey data, imputation for missing data etc.								
Course Contents & Topics	Topics may include: survey design and planning; survey quality and ethics; implementation matters like management of survey staff, respondent relationship and logistical issues; and sampling methods like simple random sampling, systematic sampling, stratified sampling, cluster sampling, multi-stage sampling, sample size determination, post-stratification, ratio and regression estimation methods, non-sampling errors and biases, non-responses and missing data. Case studies of major applications of sample survey methods in the public and private sectors, with some examples on the analysis and application of the statistical data thus produced, will be discussed.								
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 demonstrate knowledge and understanding of the various steps to be taken in the planning and implementation of sample surveys								
	CLO 2 design different sample schemes and select the most efficient and suitable one for adoption for a particular survey - make statistical inference on parameters based on a sample								
	CLO 3 judge whether the statistics presented by other survey takers are trustworthy								
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass or already enrolled in BIOL2102, or (ECON1280 and any University level 2 course), or (STAT1601 and any University level 2 course), or (STAT1602 and any University level 2 course), or STAT2601, or (STAT1603 and any University level 2 course), or STAT2901.								
Offer in 2020 - 2021	Y 2nd	d sem Offer	in 2021 - 2022 :	Υ		Examination	May		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.								
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.								
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.								
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply								

	Fail	Demonstrate little or of analytical and cr	knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-l	pased course					
Course Teaching	Activitie	s	Details		No. of Hours		
& Learning Activities	Lectures	3			36		
	Tutorials	3			12		
	Reading	/ Self study			100		
Assessment Methods and Weighting	Methods	5	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignm	ients	Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3		
	Examina	ation	One 2-hour written examination	75	CLO 1,2,3		
Required/recommended reading and online materials	S. L. Lohr: Sampling: Design and Analysis, 2nd edition (Duxbury Press, 2010) R. L. Scheaffer, W. Mendenhall, & R. L. Ott: Elementary Survey Sampling (Duxbury Press, 2011, 7th edition) W. G. Cochran: Sampling Techniques (John Wiley & Sons Ltd., 1997) R. M. Groves, F. J. Fowler, M. P. Couper, J. M. Lepkowski, E. Singer, R. Tourangeau: Survey Methodology (John Wiley & Sons Ltd., 2009, 2nd edition) L. Kish: Survey Sampling (John Wiley & Sons, Inc., 1995) P. Salant & D. A. Dillman: How to Conduct Your Own Survey (John Wiley & Sons, Inc., 1994)						
Course Website		odle.hku.hk		,			

Course website	nup://mood	JIE.IIKU.IIK				
STAT3618	Derivativ	es and risk manage	ement (6 credits)	Academic Yea	ar 2020	
Offering Department	Statistics 8	& Actuarial Science		Quota		
Course Co-ordinator	Dr R W L Wong, Statistics & Actuarial Science (rwong @hku.hk)					
Teachers Involved	(Dr R W L	Wong, Statistics & Actua	arial Science)			
Course Objectives	Nowadays all risk managers must be well versed in the use and valuation of derivatives. The two basic types					
			linear payoff) and options (having			
			ng payoffs or alternatively they are			
	aims at demonstrating the practical use of financial derivatives in risk management. Emphases are on pricing an					
Carrage Camtanta		rategies, and the no-arb			. f. t	
Course Contents & Topics			ptions and the no-arbitrage principle futures and swaps; trading strated			
& Topics			ising the binomial-tree model; valua			
			model; the Greeks: their calculation	•		
			nakers; exotic options: Asian option		•	
		d exchange options.		,,, -		
Course Learning			ourse, students should be able to:			
Outcomes	CLO 1 us	e futures, forwards, opti	ons and swaps to formulate financia	al strategies		
	CLO 2 de	termine the payoff and	the value of various derivative pro-	ducts using binomial tree	and Black-Scholes	
	for	mula				
	CLO 3 ex	plain how derivative pro	ducts can be used as tools to mana	ige financial risk		
	CLO 4 red	cognize how to decompo	ose complicated derivatives into a p	ortfolio of standard derivat	ives	
Pre-requisites		AT3615; and				
(and Co-requisites			in STAT3910, or have already enro			
and Impermissible			in STAT3905, or have already enro			
combinations)		•	in FINA2322, or have already enro	lled in this course; and		
Off ! 0000 0004		c(Actuarial Science) stu		F	D	
Offer in 2020 - 2021		sem Offer in 2021 - 20		Examination	Dec	
Grade Descriptors	Α		tery at an advanced level of extensive kno rong analytical and critical abilities and logic			
(A+ to F)	to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and					
	presentational skills.					
	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar					
	and some unfamiliar situations. Apply effective organizational and presentational skills.					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning					
	outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to mos familiar situations. Apply moderately effective organizational and presentational skills.					
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcom					
	Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail		s. Apply limited of barely effective organization and skills represented and skill represented and skills represented and skills represented and skills represented and skills represented and skills represented and skills represented and skills represented and skills represen		earning outcomes. Lack	
	· u	of analytical and critical ab	oilities, logical and coherent thinking. Show	v very little or no ability to app		
			presentational skills are minimally effective of	or ineffective.		
Course Type	1	sed course	I=			
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials	0 15 1 1			12	
		Self study			100	
Assessment Methods	Methods		Details	Weighting in final	Assessment	
and Weighting				course grade (%)	Methods	
			Course autority (conjumnments		to CLO Mapping	
	Assignme	nts	Coursework (assignments, tutorials, and a class test)	25	CLO 1,3	
	Evaminati	on	One 2-hour written examination	75	CI O 1 2 2 4	
Doguirod/rocommonded	Examinati		Tone 2-nour whiten examination Other Derivatives (Prentice Hall, 20		CLO 1,2,3,4	
Required/recommended reading and	18, 24.	Options, rutures, and t	Julei Denvauves (Prenuce Hall, 20	os, rui edition), Chapters	J, J-1, 8-11, 13, 17	
online materials		R I · Derivatives Mark	ets (Addison Wesley, 2006, 2nd ed	ition) Chanters 1-2 4-5-7	-14 23	
Omme materials			Financial Institutions (Pearson High			
Course Website	http://moo	U U		5uuduuloii, 2010, 2110 00		
	p.,//11000					

STAT3620	Modern	nonparametric stati	stics (6 credits)	Academic Ye	ar 2020		
Offering Department	Statistics & Actuarial Science Quo						
Course Co-ordinator	Dr W T Li,	W T Li, Statistics & Actuarial Science (wentaoli@hku.hk)					
Teachers Involved	(Dr W T Li	Dr W T Li,Statistics & Actuarial Science)					
Course Objectives	The cours	The course aims to acquaint students with the fundamentals, basic properties and use of classical and modern					
•	nonparam	onparametric statistical methods for data analysis.					
Course Contents	Topics may include: order-statistics; goodness-of-fit tests; rank tests for single-sample and two-indeper						
& Topics	samples;	tests for designed exp	periments; permutation tests; tests	for trends and associa	tion; jackknife and		
	bootstrapp	oing methods; nonparam	netric regression.				
Course Learning	On succes	ssful completion of this c	course, students should be able to:				
Outcomes	CLO 1 ide	entify appropriate nonpa	rametric methods for analyzing data	a			
	CLO 2 pe	erform a variety of nonpa	rametric statistical analyses				
	CLO 3 ga	ain a working proficiency	y in the use of statistical software	for data management an	d performing basic		
	nc	onparametric statistical a	nalyses				
	CLO 4 eff	fectively communicate fir	ndings and conclusions				
Pre-requisites	Pass in S	TAT2602 or STAT3902					
(and Co-requisites							
and Impermissible							
combinations)							
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20		Examination	Dec		
Grade Descriptors (A+ to F)	A	learning outcomes. Show st	tery at an advanced level of extensive known analytical and critical abilities and logic	cal thinking, with evidence of original	ginal thought, and ability		
,		to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	В	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course					
	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning						
		outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most					
		familiar situations. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes.					
	Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply						
		knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course						
	of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-ba	ased course	,				
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures				36		
3	Tutorials				12		
		Self study			100		
Assessment Methods	Methods	och stady	Details	Weighting in final			
and Weighting	wethous		Details	Weighting in final course grade (%)	Assessment Methods		
and Weighting				course grade (76)	to CLO Mapping		
			Coursework (assignments,		to CLO Mapping		
	Assignme	ents	tutorials and a class test)	50	CLO 1,2,3,4		
	Examinat	ion	One 2-hour written examination	50	CLO 1,2,3		
Di	-		1.		GLO 1,2,3		
Required/recommended reading and			I Methods for Ranking Data (Springer : Nonparametric Statistical Inference		2011)		
online materials		•	. Nonparametric Statistical Interence odern Nonparametric Statistics (Dux	, , ,	2011)		
Omine materials			plied Nonparametric Statistical Meth		see 2007)		
			tric Statistics (Springer, 2016)	ious, +iii euilioii (ONO pre	,33, 2001 j		
Course Website		dle.hku.hk	and Ciausius (Opinigor, 2010)				
Course Websile	πιφ.//που	dic.iiku.iik					

STAT3621	Statistical data analysis (6 credits)	Academic Year	2020			
Offering Department	Statistics & Actuarial Science	Quota	50			
Course Co-ordinator	Dr D Y Zhang, Statistics & Actuarial Science (doraz@hku.hk)					
Teachers Involved	(Dr D Y Zhang, Statistics & Actuarial Science)					
Course Objectives	Building on prior coursework in statistical methods and modeling, students will get a deeper understanding of the entire process of data analysis. The course aims to develop skills of model selection and hypotheses formulation so that questions of interest can be properly formulated and answered. An important element deals with model review and improvement, when one's first attempt does not adequately fit the data. Students will learn how to explore the data, to build reliable models, and to communicate the results of data analysis to a variety of audiences.					
Course Contents & Topics	Descriptive statistics, presentation and visualization of data; Simple statistical are sample case using parametric and nonparametric methods; Regression analyst and model diagnostic checking; Analysis of Variance (ANOVA): 1-way, two Covariance analysis; Categorical and count data: binary logistic regression, Pois Real data sets will be presented for modelling and analysis using statistic experience.	es: model fitting; vo-way and high eson regression.	variable selection er-way ANOVA;			
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 make good sense of the problem and identify what to measure for the qu	estion of interest				
	CLO 2 summarize and describe the quantitative and qualitative data using some simple appropriate statistical measures					
	CLO 3 identify the association among several continuous or discrete variables					
	CLO 4 carry out appropriate and comprehensive statistical analyses based on real life data including model selection, perform model diagnostics, formulate testable hypotheses, make appropriate statistical inferences, make interpretations on the findings and report writing					
Pre-requisites	Pass in STAT3600 or STAT3907					

(and Co-requisites and Impermissible combinations)	(Students	are strongly recommend	ded to take STAT2603 or STAT260	04 prior to taking this cours	se.)	
Offer in 2020 - 2021	Y 2nd	2nd sem Offer in 2021 - 2022 : Y			May	
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.				
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	outcomes. Show evidence	ncomplete command of knowledge and s of some analytical and critical abilities and derately effective organizational and preser	I logical thinking, and ability to a		
	D	Show evidence of some coh	ted command of knowledge and skills requesternerent and logical thinking, but with limited as Apply limited or barely effective organiza	analytical and critical abilities. Sh		
	Fail	of analytical and critical at	dence of command of knowledge and skills pilities, logical and coherent thinking. Sho presentational skills are minimally effective	w very little or no ability to ap		
Course Type	Lecture-b	ased course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures			36		
	Tutorials				12	
	Reading / Self study				100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents	Coursework (assignments and a class test)	50	CLO 1,2,3,4	
	Examina	tion	One 3-hour written examination	50	CLO 1,2,3,4	
Required/recommended reading and online materials	2013)		arning, with Applications in R, by J			
	 The Statistical Sleuth: A Course in Methods of Data Analysis, by Fred Ramsey (Author), Daniel Schafer (Author). Applied Regression Analysis and Other Multivariable Methods, by David G. Kleinbaum (Author), Lawrence Kupper (Author), Azhar Nizam (Author), Eli S. Rosenberg (Author). Learning R: A Step-by-Step Function Guide to Data Analysis, by Richard Cotton (Author). 					
Course Website	http://mod	odle.hku.hk				

STAT3622	Data visualization (6 credits) Academic Y				2020	
Offering Department	Statistics & Actuarial Science Quota				50	
Course Co-ordinator	Prof G Yi	Prof G Yin, Statistics & Actuarial Science (gyin@hku.hk)				
Teachers Involved	(Dr Y Far	(Dr W Du, Statistics & Actuarial Science) (Dr Y Fan, Statistics & Actuarial Science) (Prof G Yin, Statistics & Actuarial Science)				
Course Objectives		se will focus on how to work with st ze data. Students will learn a set o	0 1 70 1	. ,	,	
Course Contents & Topics	Grammar visualizin	of graphics, visualizing patterns g texts.	over time, visualizing	relationship, visualizing spa	tial relationships	
Course Learning	On succe	ssful completion of this course, stu	dents should be able to:			
Outcomes	CLO 1	choose the best chart that fits t	he data			
	CLO 2	create a compelling visualization	on using computer softw	are		
	CLO 3	communicate effectively using	statistical graphics			
	CLO 4	critically evaluate graphics and	suggest improvements			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	TAT2602 or STAT3902				
Offer in 2020 - 2021	Y 2n	d sem Offer in 2021 - 2022 : N		Examination	No Exam	
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the cours learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and abilit to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational an presentational skills.					
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail	Demonstrate little or no evidence of com of analytical and critical abilities, logical problems. Organization and presentation	al and coherent thinking. Sho	ow very little or no ability to apply		
Course Type	Lecture-b	ased course				
Course Teaching	Activitie	s Details	Details		No. of Hours	
Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	Assessment Methods o CLO Mapping	
	Presenta	tion oral pres	sentation and in-class	40	CLO 1,2,3,4	

	Project reports	written report	60	CLO 1,2,3,4	
	Yau, Nathan (2011). Visualize This	Ŭ ,	<i>,</i>	,	
reading and	Tufle, Edwards R. (2001). The Visi		ation. 2nd edition, Graphics	s Press.	
online materials	Chang, Winston (2013). R Graphic			14.01	
	Murray, Dan (2013). Tableau Your				
	King, Ritchie, S. (2014). Visual Storytelling with D3: An Introduction to Data Visualization in JavaScript. Addison-				
	Wesley.				
Course Website	http://moodle.hku.hk				

STAT3655	Survival	analysis (6 credits))	Academic Yea	r 2020		
Offering Department	Statistics 8	& Actuarial Science		Quota			
Course Co-ordinator	Dr J F Xu,	Dr J F Xu, Statistics & Actuarial Science (xujf@hku.hk)					
Teachers Involved	(Dr J F Xu,Statistics & Actuarial Science)						
Course Objectives	This course is concerned with how models which predict the survival pattern of humans or other entities are						
	established. This exercise is sometimes referred to as survival-model construction.						
Course Contents & Topics	The nature and properties of parametric and nonparametric survival models will be studied. Topics to be covered include: the introduction of some important basic quantities like the hazard function and survival function; some commonly used parametric survival models; concepts of censoring and/or truncation; parametric estimation of the survival distribution by maximum likelihood estimation method; nonparametric estimation of the survival functions from possibly censored samples by means of the Kaplan-Meier estimator, the Nelson-Aalen estimator; and the kernel density estimator or the Ramlau-Hansen estimator and comparisons of k independent survival functions by means of the generalized log-rank test; parametric regression models; Cox's semiparametric proportional hazards regression model; and multivariate survival analysis.						
Course Learning			course, students should be able to				
Outcomes			nding of the nature of failure time	data or survival data, a ger	neralization of the		
		ncept of death and life					
	me	echanisms	some commonly used survival		es of censoring		
		•	g the Cox's semiparametric propo				
			a multivariate setup to accommo	date multivariate survival data	1		
Pre-requisites		「AT3902, or already en	· · · · · · · · · · · · · · · · · · ·				
(and Co-requisites		TAT3600 or STAT3901;					
and Impermissible	Not for stu	dents who have passed	d in STAT3955, or already enrolled	in this course.			
combinations)	N Offe	er in 2021 - 2022 : N		Eveninetien			
Offer in 2020 - 2021 Grade Descriptors	A OIIE		stery at an advanced level of extensive k	Examination	ttoining all the source		
(A+ to F)	to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familia and some unfamiliar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning						
	D	outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes.					
		Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-ba	ased course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading /	Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	nts	Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3,4		
	Examinati	on	One 3-hour written examination	75	CLO 1,2,3,4		
Required/recommended reading and online materials	Hosmer, E 1999)). W. and Lemeshow, S	is of Survival Data (Chapman and 5.: Applied Survival Analysis: Regr //. L.: Survival Analysis: Technique	ression Modeling of Time to	, ,		
		ew York, 2005, 2nd ed.)					
Course Website	http://moo	dle hku hk					

STAT3799	Directed studies in statistics (6 credits)	Academic Year	2020
Offering Department	Statistics & Actuarial Science	Quota	50
Course Co-ordinator	Prof S M S Lee, Statistics & Actuarial Science (smslee@hku.hk)		
Teachers Involved	(Various teachers as the assessors of oral presentations and written reports, Sta	atistics & Actuarial	Science)
Course Objectives	To enhance students' knowledge of a particular topic and students' self-directed	l learning and critic	al thinking skills.
Course Contents & Topics	The student undertakes a self-managed study on a topic in statistics under the topic is preferably one not sufficiently covered in the regular curriculum. The di or a synthesis of published work on the subject, or a laboratory or field stunderstanding of the subject. The project may not require an element of original	rected study can b udy that would e	e a critical review
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 gain first-hand experience in solving a research or applied problem in si CLO 2 develop skills in important technical tools, including the use of comput		

	s	tatistical research and da	ta analyses			
			ne findings of a research study			
	CLO 4 m	ake concise oral present	tation of the findings of a research	study		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in at least 24 credits of advanced level disciplinary core/elective courses in the Decision Analytics/Risk Management/Statistics Majors; and Not for students who have already enrolled in STAT4799 in this academic year. This capstone course is only for students majoring in Decision Analytics/Risk Management/Statistics; and subject to the consent of course coordinator. This course is mutually exclusive with STAT4710. The earliest that a student is allowed to take this capstone course is their year 3 study.					
Offer in 2020 - 2021	Y 1st	sem 2nd sem Offer	in 2021 - 2022 : Y	Examination	No Exam	
Grade Descriptors (A+ to F)	A	original thought. Insightful us to quote/reference aptly. Cr organizational and presenta areas relevant to the topic.]	p of the subject. Show strong analytical se and critical analysis / evaluation of infor itical use of data and results to draw approximational skills. [Work of A+ should show cor	rmation drawn from a full range o propriate and insightful conclusio nsiderable additional work beyond	f high quality sources and ns. Apply highly effective d that is required in wider	
	В	relevant information from so	asp of the subject. Evidence of analytica purces, showing ability to make meaningfu /. Correct use of data of results to draw a	I comparisons between different	secondary interpretations	
	С	·				
	D	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Demonstrate use and reference of several sources, but mainly through summary rather than analysis and comparison. Limited ability to use data and results to draw appropriate conclusions. Apply limited or barely effective organizational and presentational skills.				
	Fail	Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack of analytical and critical abilities, logical and coherent thinking. Limited use of secondary sources and no critical comparison of them. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Project-ba	ased course				
Course Teaching	Activitie	S	Details		No. of Hours	
& Learning Activities	Reading	/ Self study	discussion & meetings to be arranged by the student & the supervisor		120	
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Oral pres	sentation	oral presentation & in-class discussion	40	CLO 1,2,4	
	Research	n report	written report	60	CLO 1,2,3	
Course Website	http://mod	odle.hku.hk				

STAT3901	Life co	ntingencies I (6 cred	lits)	Academic Year	2020	
Offering Department	Statistics	& Actuarial Science		Quota		
Course Co-ordinator	Prof K C	Prof K C Yuen, Statistics & Actuarial Science (kcyuen@hku.hk)				
Teachers Involved	(Prof K C	Yuen, Statistics & Actua	rial Science)			
Course Objectives	until-dea financial	The major objectives of this course are to integrate life contingencies into a full probabilistic framework. The time until-death random variable is the basic building block by which models for life insurances, designed to reduce the financial impact of the random event of untimely death, are developed. This course introduces the concepts of life contingencies and the basic mathematical skills for modelling life insurance products.				
Course Contents & Topics			butions; life table functions; select and ultimate dom variable; benefit premiums.	tables; life insur	ance models; life	
Course Learning	On succe	essful completion of this	course, students should be able to:			
Outcomes	CLO 1 c	calculate the expected va	lues, variances, probabilities, and percentiles for	r survival-time ra	ndom variables	
	CLO 2 d	define the continuous su	rvival-time random variable that arises from th	ne discrete survi	val-time random	
		ariable using some assu	mptions for fractional ages			
	CLO 3 c	define present-value-of-b	enefit random variables defined on survival-time	random variable	·S	
	CLO 4 c	define and calculate the	expected values, variances and probabilities for	present-value-o	f-benefit random	
	\	/ariables, present-value-o	of-loss-at-issue random variables, and present-va	alue-of-loss rand	om variables	
	CLO 5 calculate benefit premiums for life insurances and annuities					
(and Co-requisites	(Pass in (Pass in	STAT2602 and STAT36 STAT2902 and (Pass in	15) or STAT3902 or already enrolled in this course)) or	r		
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	(Pass in (Pass in (Pass in	STAT2602 and STAT36 STAT2902 and (Pass in STAT2602 and STAT29	15) or STAT3902 or already enrolled in this course)) or 02)		Dec	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	(Pass in (Pass in (Pass in	STAT2602 and STAT36 STAT2902 and (Pass in STAT2602 and STAT29 st sem Offer in 2021 - 2	15) or STAT3902 or already enrolled in this course)) or 02) 022 : Y	Examination	Dec	
(and Co-requisites and Impermissible combinations)	(Pass in (Pass in (Pass in	STAT2602 and STAT36 STAT2902 and (Pass in STAT2602 and STAT29 st sem Offer in 2021 - 2 Demonstrate thorough ma learning outcomes. Shows	15) or STAT3902 or already enrolled in this course)) or 02)	Examination kills required for atta	aining all the course al thought, and ability	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	(Pass in (Pass in (Pass in	STAT2602 and STAT36 STAT2902 and (Pass in STAT2602 and STAT29 at sem Offer in 2021 - 2 Demonstrate thorough ma learning outcomes. Show set of apply knowledge to a sepresentational skills. Demonstrate substantial celearning outcomes. Show elearning outcomes. Show elearning outcomes. Show elearning outcomes. Show elearning outcomes.	15) or STAT3902 or already enrolled in this course)) or 02) 022: Y stery at an advanced level of extensive knowledge and sistrong analytical and critical abilities and logical thinking, wit	Examination kills required for atta th evidence of origina Apply highly effective for attaining at leas	aining all the course al thought, and ability e organizational and at most of the course	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	(Pass in (Pass in (Pass in A	STAT2602 and STAT36 STAT2902 and (Pass in STAT2602 and STAT29 st sem Offer in 2021 - 2 Demonstrate thorough ma learning outcomes. Show of apply knowledge to a supresentational skills. Demonstrate substantial or learning outcomes. Show of and some unfamiliar situational properties of the state of the st	15) or STAT3902 or already enrolled in this course)) or 02) 022: Y stery at an advanced level of extensive knowledge and sitstrong analytical and critical abilities and logical thinking, wit vide range of complex, familiar and unfamiliar situations. A command of a broad range of knowledge and skills required vidence of analytical and critical abilities and logical thinking	Examination kills required for atta th evidence of origina Apply highly effective of for attaining at leas in, and ability to apply or attaining most of	aining all the course al thought, and ability e organizational and at most of the course knowledge to familiar the course learning	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	(Pass in (Pass in (Pass in A)) Y 1s A B C	STAT2602 and STAT36 STAT2902 and (Pass in STAT2602 and STAT29 at sem Offer in 2021 - 2 Demonstrate thorough ma learning outcomes. Show set to apply knowledge to a sepresentational skills. Demonstrate substantial celearning outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lim Show evidence of some cocknowledge to solve probler	15) or STAT3902 or already enrolled in this course)) or O2) 022: Y stery at an advanced level of extensive knowledge and sistrong analytical and critical abilities and logical thinking, wit vide range of complex, familiar and unfamiliar situations. Apply effective organizational and presentational skills. Incomplete command of knowledge and skills required for some analytical and critical abilities and logical thinking oderately effective organizational and presentational skills. Intelligence of some analytical and critical abilities and logical thinking oderately effective organizational and presentational skills. Intelligence of knowledge and skills required for attaining herent and logical thinking, but with limited analytical and critical and critical and critical and critical and critical and critical skills. Intelligence of knowledge and skills required for attaining herent and logical thinking, but with limited analytical and critical and critical and critical and critical and critical abilities and logical thinking but with limited analytical and critical and critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critical abilities and logical thinking observed the critic	Examination kills required for attath evidence of origina Apply highly effective of for attaining at leas and ability to apply or attaining most of g, and ability to apply gg some of the course itical abilities. Show I	aining all the course al thought, and ability e organizational and at most of the course knowledge to familiar the course learning y knowledge to most e learning outcomes. limited ability to apply	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	(Pass in (Pass in (Pass in A)) Y 1s B C	STAT2602 and STAT36 STAT2902 and (Pass in STAT2602 and STAT29 St sem Offer in 2021 - 2 Demonstrate thorough ma learning outcomes. Show at the apply knowledge to a very presentational skills. Demonstrate substantial or learning outcomes. Show and some unfamiliar situations. Apply me Demonstrate peneral but outcomes. Show evidence familiar situations. Apply me Demonstrate partial but fiir Show evidence of some control knowledge to solve probler Demonstrate little or no evidenal visual and critical and criti	15) or STAT3902 or already enrolled in this course)) or O2) 022: Y stery at an advanced level of extensive knowledge and sl strong analytical and critical abilities and logical thinking, wit wide range of complex, familiar and unfamiliar situations. A command of a broad range of knowledge and skills required vidence of analytical and critical abilities and logical thinking ons. Apply effective organizational and presentational skills incomplete command of knowledge and skills required for some analytical and critical abilities and logical thinking oderately effective organizational and presentational skills. itied command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required analytical and critical abilities and logical thinking, but with limited analytical and critical abilities and logical thinking, but with limited analytical and critical abilities and logical thinking.	Examination kills required for attath evidence of original Apply highly effective of for attaining at leas in and ability to apply or attaining most of its abilities. Show I intational skills. aining the course lear	aining all the course al thought, and ability e organizational and at most of the course knowledge to familiar the course learning y knowledge to most e learning outcomes. limited ability to apply rming outcomes. Lack	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	(Pass in (Pa	STAT2602 and STAT36 STAT2902 and (Pass in STAT2602 and STAT29 St sem Offer in 2021 - 2 Demonstrate thorough ma learning outcomes. Show at the apply knowledge to a very presentational skills. Demonstrate substantial or learning outcomes. Show and some unfamiliar situations. Apply me Demonstrate peneral but outcomes. Show evidence familiar situations. Apply me Demonstrate partial but fiir Show evidence of some control knowledge to solve probler Demonstrate little or no evidenal visual and critical and criti	15) or STAT3902 or already enrolled in this course)) or STAT3902 or already enrolled in this course)) or O2) 022: Y stery at an advanced level of extensive knowledge and sistrong analytical and critical abilities and logical thinking, wit wide range of complex, familiar and unfamiliar situations. A command of a broad range of knowledge and skills required vidence of analytical and critical abilities and logical thinking ons. Apply effective organizational and presentational skills. incomplete command of knowledge and skills required for 5 some analytical and critical abilities and logical thinking oderately effective organizational and presentational skills. itted command of knowledge and skills required for attaining herent and logical thinking, but with limited analytical and criss. Apply limited or barely effective organizational and present dence of command of knowledge and skills required for attaining the organizational and present dence of command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge	Examination kills required for attath evidence of original Apply highly effective of for attaining at leas in and ability to apply or attaining most of its abilities. Show I intational skills. aining the course lear	aining all the course al thought, and ability e organizational and at most of the course knowledge to familiar the course learning y knowledge to most e learning outcomes. limited ability to apply rming outcomes. Lack	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	(Pass in (Pa	STAT2602 and STAT36 STAT2902 and (Pass in STAT2602 and STAT29 st sem Offer in 2021 - 2 Demonstrate thorough ma learning outcomes. Show of apply knowledge to a value of a seminary of the seminary outcomes. Show of and some unfamiliar situational Demonstrate general but outcomes. Show evidence familiar situations. Apply material situations. Apply material situations. Apply material situations. Apply material situations. Apply material situations. Apply material situations of some control of analytical and critical a problems. Organization and based course	15) or STAT3902 or already enrolled in this course)) or STAT3902 or already enrolled in this course)) or O2) 022: Y stery at an advanced level of extensive knowledge and sistrong analytical and critical abilities and logical thinking, wit wide range of complex, familiar and unfamiliar situations. A command of a broad range of knowledge and skills required vidence of analytical and critical abilities and logical thinking ons. Apply effective organizational and presentational skills. incomplete command of knowledge and skills required for 5 some analytical and critical abilities and logical thinking oderately effective organizational and presentational skills. itted command of knowledge and skills required for attaining herent and logical thinking, but with limited analytical and criss. Apply limited or barely effective organizational and present dence of command of knowledge and skills required for attaining the organizational and present dence of command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge	Examination kills required for attath evidence of original Apply highly effective of for attaining at leas in and ability to apply or attaining most of its abilities. Show I intational skills. aining the course lear	aining all the course al thought, and ability e organizational and at most of the course knowledge to familiar the course learning y knowledge to most e learning outcomes. limited ability to apply rming outcomes. Lack	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	(Pass in (Pass in (Pass in (Pass in Pass in (Pass in Pass in (Pass in Pass in	STAT2602 and STAT36 STAT2902 and (Pass in STAT2602 and STAT29 st sem Offer in 2021 - 2 Demonstrate thorough ma learning outcomes. Show of the apply knowledge to a supresentational skills. Demonstrate substantial culearning outcomes. Show evidence familiar situations. Apply m Demonstrate general but outcomes. Show evidence familiar situations. Apply m Demonstrate partial but lim Show evidence of some cocknowledge to solve probler Demonstrate little or no evidenalytical and critical aproblems. Organization and based course	15) or STAT3902 or already enrolled in this course)) or STAT3902 or already enrolled in this course)) or STAT3902 or already enrolled in this course)) or STAT3902 or already enrolled in this course)) or STAT3902 or already enrolled in this course) or Stery at an advanced level of extensive knowledge and strong analytical and critical abilities and logical thinking, with which is a broad range of knowledge and skills required vidence of analytical and critical abilities and logical thinking ons. Apply effective organizational and presentational skills. In incomplete command of knowledge and skills required for some analytical and critical abilities and logical thinking, but with limited analytical and crins. Apply limited or barely effective organizational and presentational skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command the comman	Examination kills required for attath evidence of original Apply highly effective of for attaining at leas in and ability to apply or attaining most of its abilities. Show I intational skills. aining the course lear	aining all the course al thought, and ability e organizational and at most of the course knowledge to familiar the course learning y knowledge to most e learning outcomes. limited ability to apply rning outcomes. Lack knowledge to solve	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	(Pass in (Pa	STAT2602 and STAT36 STAT2902 and (Pass in STAT2602 and STAT29 St sem Offer in 2021 - 2 Demonstrate thorough ma learning outcomes. Show of the apply knowledge to a value of the apply knowledge to a value of the apply knowledge to a value of the apply knowledge to a value of the apply knowledge to a value of the apply knowledge of the apply knowledge of the apply knowledge of the apply knowledge of the apply knowledge of some control of the apply knowledge to solve probler of analytical and critical approblems. Organization and chased course	15) or STAT3902 or already enrolled in this course)) or STAT3902 or already enrolled in this course)) or STAT3902 or already enrolled in this course)) or STAT3902 or already enrolled in this course)) or STAT3902 or already enrolled in this course) or Stery at an advanced level of extensive knowledge and strong analytical and critical abilities and logical thinking, with which is a broad range of knowledge and skills required vidence of analytical and critical abilities and logical thinking ons. Apply effective organizational and presentational skills. In incomplete command of knowledge and skills required for some analytical and critical abilities and logical thinking, but with limited analytical and crins. Apply limited or barely effective organizational and presentational skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command of knowledge and skills required for attaining the command the comman	Examination kills required for attath evidence of original Apply highly effective of for attaining at leas in and ability to apply or attaining most of its abilities. Show I intational skills. aining the course lear	aining all the course at thought, and ability e organizational and at most of the course knowledge to familiar the course learning y knowledge to most e learning outcomes. Imited ability to apply rning outcomes. Lack knowledge to solve	

Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments	Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3,4,5			
	Examination	One 3-hour written examination	75	CLO 1,2,3,4,5			
Required/recommended reading and online materials	Itasca, Illinois: The Society of Actu	Bowers. N.L., Gerber, H.U., Hickman, J.C., Jones, D.A. & Nesbitt, C.J.: Actuarial Mathematics (1997, 2nd edition), Itasca, Illinois: The Society of Actuaries Dickson, C.M.D., Hardy, M.R., and Waters, H.R.: Actuarial Mathematics for Life Contingent Risks (Cambridge:					
Course Website	http://moodle.hku.hk						

CTAT2002	C4=4!=4!	al madale /C ana -lit-		Anadamia Va	2000
STAT3902		cal models (6 credits	5)	Academic Ye	
Offering Department		& Actuarial Science	. ("@11 11)	Quota	
Course Co-ordinator		, Statistics & Actuarial S	, , ,		
Teachers Involved		u,Statistics & Actuarial S			
Course Objectives	study the testing, th both quar	concepts and methods te two major areas of sta ntitative skills and qualit	AT2901 Probability and Statistics: Fas of statistics. The course will lay attistical inference. Through the study tative perceptions essential for mak VEE Mathematical Statistics from the	emphasis on the estima of this course, students ing rigorous statistical an	tion and hypothesis will be equipped with
Course Contents & Topics	Distribution estimator confidence two normal	on and density of functio (MLE), moment estima e interval estimations fo	on of random variables; order statisti ator, Bayesian estimator, propertie or normal mean, the difference of two sample confidence intervals; power	cs, central limit theorem, s of estimators, limiting o normal means, normal	properties of MLE variance, the ratio of
Course Learning		•	course, students should be able to:		
Outcomes	CLO 1 ur	nderstand the importance	e of sufficient statistic(s) in data redu erval estimation, and testing hypothe		ences such as point
	CLO 2 de	erive maximum likelihood	d estimators of parameters to calcula	ate maximum likelihood e	stimates
	CLO 3 lo	cate pivotal quantity to c	construct confidence intervals of para	ameters	
			t hypotheses associated with one-sand non-normal distributions with larg		normal distributions
Pre-requisites	Pass in S	TAT2901; and			
(and Co-requisites and Impermissible combinations)		udents who have passed Actuarial Science) studer	d in STAT2602, or already enrolled in standard in the only.	n this course; and	
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20	022 : Y	Examination	Dec
Grade Descriptors	Α		stery at an advanced level of extensive known		
(A+ to F)	learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.				
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lac of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solv problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-b	ased course			
Course Teaching	Activities	s	Details		No. of Hours
& Learning Activities	Lectures				36
	Tutorials				12
	Reading / Self study				100
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3,4
	Examination		One 3-hour written examination	75	CLO 1,2,3,4
Required/recommended	Miller I. &	Miller M.: John E. Freu	und's Mathematical Statistics with A	pplications (Pearson Edu	ucation International
reading and online materials	edition)	V., McKean J. W. & Crai	ig A. T.: Introduction to Mathematicalics	al Statistics (Pearson Pre	entice Hall, 2005, 6tl
	Larsen R		Introduction to Mathematical Statisti	cs and Its Appications (F	Pearson Internationa
Course Website	http://mod	odle.hku.hk			

STAT3903	Stochastic models (6 credits)	Academic Year	2020		
Offering Department	Statistics & Actuarial Science	Quota			
Course Co-ordinator	Prof J J F Yao, Statistics & Actuarial Science (jeffyao@hku.hk)				
Teachers Involved	(Prof J J F Yao, Statistics & Actuarial Science)				
Course Objectives	This is an introductory course in stochastic processes				
Course Contents	Introduction to probability theory, conditional probability and expectation, Markov chains, random walk models,				
& Topics	classification of states in a Markov chain, calculation of limiting probabilities	and mean time s	pent in transient		

	states, Poisson process, distribution of inter-arrival time and waiting time, conditional distribution of the arrival time Brownian Motion, hitting time and maximum variable, geometric Brownian motion, the Black-Scholes option pricing formula, Gaussian bridge, and stationary processes. Birth-and-death process, branching process and renewal process may also be covered (if time permits).					
Course Learning			course, students should be able to:			
Outcomes			ethod to calculate the mean and pro			
			ls of Markov chains, the Poisson pro	,		
			stic models can be applied to the stud	dy of real-life phenomena		
Pre-requisites (and Co-requisites and Impermissible combinations)	Not for stu Not for stu		d in MATH3603, or have already enro d in STAT3603, or have already enro nts only.			
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	2022 : Y	Examination	May	
Grade Descriptors (A+ to F)	A	learning outcomes. Show s	stery at an advanced level of extensive kno trong analytical and critical abilities and logic vide range of complex, familiar and unfamilia	al thinking, with evidence of ori	ginal thought, and ability	
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the cour learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to famil and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lac of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	i	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading / Self study				100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignments		Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3	
	Examinat	ion	One 3-hour written examination	75	CLO 1,2,3	
Required/recommended reading and online materials	S. M. Ros	s: Introduction to Proba	bility Models (9th edition)			
Course Website	http://moo	dle.hku.hk				

STAT3904	Corpora	te finance for actuarial science (6 credits)	Academic Year	2020			
Offering Department	Statistics 8	& Actuarial Science	Quota				
Course Co-ordinator	Dr D Lee,	Statistics & Actuarial Science (leedav@hku.hk)					
Teachers Involved	(Dr D Lee,	Statistics & Actuarial Science)					
Course Objectives	Finance fr principles evaluate ir	se is designed for actuarial science students to receive rom the Society of Actuaries. The objective of this cours of corporate finance. The course will provide students expectment and financing decisions for corporations.	e is to introduce students to with a systematic framework	the fundamental k within which to			
Course Contents & Topics	covered in measures important pricing mo	first part of the course will give an introduction to corporate finance and provide an overview of some topics red in STAT2902 and STAT3615. These include financial markets and companies, time value of money, and sures and performance assessment of financial performance. The main part of the course will focus on some retant topics of corporate finance including: portfolio theory, Markowitz mean-variance analysis, capital asset g model, weighted average cost of capital, market efficiency, capital structure and dividend policy, financial age and firm value, and option pricing models.					
Course Learning	On succes	ssful completion of this course, students should be able to:					
Outcomes	CLO 1 describe the tasks of a financial manager and the financial decisions made by a corporation						
	CLO 2 recall the use of present and future values in calculating the value of bonds and stocks						
	CLO 3 assess financial performance using various investment criteria and techniques of project analysis						
	CLO 4 analyze the mean-variance portfolio theory, capital asset pricing model and arbitrage pricing theory						
	CLO 5 identify the factors to be considered by a company when deciding on its capital structure and dividend policy, and also the impact of financial leverage and long/short term financing policies on capital structure						
	CLO 6 describe the various forms of market efficiency						
	CLO 7 calculate the value of options using the binomial option pricing model						
Pre-requisites (and Co-requisites and Impermissible combinations)	L \	ACCT1101 and STAT2902) or (Pass in STAT3610 and ST. Idents who have passed in FINA1310, or have already enr	/2/				
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2022 : Y	Examination	May			
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	D	Demonstrate partial but limited command of knowledge and skills requ					

		Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited abilit knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
		of analytical and cr	rate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lac ical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve . Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-bas	sed course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading / Self study				100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignmen	ts	Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3,4,5,6,7		
	Examinatio	n	One 3-hour written examination	75	CLO 1,2,3,4,5,6,7		
Required/recommended reading and online materials	Berk, J. et a	Brealey, R.A. et al.: Principles of Corporate Finance (McGraw-Hill, 2017, 12th edition) Berk, J. et al.: Corporate Finance (Pearson, 2017, 4th edition) McDonald, R.L.: Derivatives Markets (Pearson, 2013, 3rd edition)					
Course Website	http://moodl	http://moodle.hku.hk					

A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the colerating outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original though, nation to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply fighty effective organizational presentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the colerating outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to fa and some unfamiliar situations. Apply effective organizational and presentational skills. C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course lear outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar situations. Apply moderately effective organizational and presentational skills. D Demonstrate partial but limited command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some coherent and logical thinking and analytical and critical abilities. Show limited ability to familiar situations. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining most of the course learning outcomes. Organizational and presentational skills are minimally effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining most of the course learning outcomes. Organizational and presentational skills required for attaining most of the course learning outcomes. Organizational appression and presentational skills required for attaining most of the course learning outcomes. Organizational and presentational skills required f	STAT3905	Introduc	tion to financial der	rivatives (6 credits)		Academic Year	2020	
Course Objectives	Offering Department	Statistics 8	& Actuarial Science	,		Quota		
This course aims at providing an understanding of the fundamental concepts of financial derivatives. Emphiare on basic trading and hedging strategies, and the no-arbitrage principle. Derivatives; short-selling; forward contracts; call options; put options; equity-linked CD; spreads and coll hedging, financial forwards and futures; commodify swaps; interest rate swaps; put-call parity. Chourse Learning Outcomes CLO 1 define and recognize the definitions of terms commonly used in derivatives markets CLO 2 evaluate the payoff, profit, and properties of basic derivative contracts, including forwards, futures, option and swaps CLO 3 explain how derivative securities can be used as tools to manage financial risk Pass in STAT2902; and Not for students who have passed in STAT3618, or have already enrolled in this course; and Not for students who have passed in STAT3618, or have already enrolled in this course; and For BSc(Actuarial Science) students only. Pre-requisites and Co-requisites and Universal Course of State of St	Course Co-ordinator	Dr K C Che	eung, Statistics & Actua	rial Science (kccg@hku.hk)				
are on basic trading and hedging strategies, and the no-arbitrage principle. Derivatives: short-selling: forward contracts; call options; put options; equity-linked CD; spreads and coll hedging, financial forwards and futures; commodly swaps; interest rate swaps; put-call parity. On successful completion of this course, students should be able to: CLO 1 define and recognize the definitions of terms commonly used in derivatives markets CLO 2 evaluate the payoff, profit, and properties of basic derivative contracts, including forwards, futures, option and swaps CLO 3 explain how derivative securities can be used as tools to manage financial risk Pass in STAT2902; and Not for students who have passed in STAT3618, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Port BSC(Actuarial Science) students only. Y 1st sem Offer in 2021 - 2022 : Y A beaming outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to a payly knowledge to a wide range of complex, familiar and unfamiliar sultuations. Apply highly effective organizational and presentational skills. B Demonstrate general but incomplete command of knowledge and skills required for attaining and sand some unfamiliar situations. Apply methods and some unfamiliar situations. Apply methods and skills required for attaining outcomes. Show evidence of some coherent and logical thinking, and ability to apply knowledge to familiar situations. Apply methods and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and l	Teachers Involved	(Dr K C Ch	neung,Statistics & Actua	rial Science)				
Course Learning Outcomes CLO 1 define and recognize the definitions of terms commonly used in derivatives markets CLO 2 evaluate the payoff, profit, and properties of basic derivative contracts, including forwards, futures, optical and swaps CLO 3 explain how derivative securities can be used as tools to manage financial risk Pre-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the colorans show evidence of original thought, and to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to a mountain stream of some unfamiliar situations. Apply inflicted or barowledge and skills required for attaining autocomes. Show evidence of some analytical and critical abilities and presentational skills. D Demonstrate perial but inclinited command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to a mountain structure of some conternational skills. D Demonstrate perial but limited command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to a familiar situations. Apply inflicted or browledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and presentational skills. D Demonstrate perial but limited command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to show evidence of some analytical and critical abilities and presentationa	Course Objectives					of financial deriva	atives. Emphase	
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and swaps CICO 3 explain how derivative securities can be used as tools to manage financial risk Pass in STAT2902; and Not for students who have passed in STAT3618, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course; and Deconstrate path and avaical enrolled in this course; and skills required for attaining all east most of th	Outcomes	CLO 1 det	fine and recognize the o	definitions of terms commonly use	ed in derivativ	es markets		
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Not for students who have passed in FINA2322, or have already enrolled in this course; and For BSc(Actuarial Science) students only. Offer in 2021 - 2022 1 Grade Descriptors (A+ to F) A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the collection of particular by the learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and a big apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational presentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the collection of the col								
For BSc(Actuarial Science) students only. Examination Dec	•							
Second Descriptors (A+ to F)					rolled in this	course; and		
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of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to sproblems. Organization and presentational skills are minimally effective or ineffective. Lecture-based course Course Type Lecture-based course Activities Activities Lectures Tutorials Reading / Self study Methods Assessment Methods and Weighting Methods Coursework (assignments, tutorials, and a class test) Examination Coursework (assignments, tutorials, and a class test) Examination McDonald, R. L.: Derivatives Markets (Addison Wesley, 2012, 3rd edition), Chapters 1-5, 7-9st.		D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
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Assignments tutorials, and a class test) Examination One 3-hour written examination 75 CLO 1,2,3 Required/recommended mcDonald, R. L.: Derivatives Markets (Addison Wesley, 2012, 3rd edition), Chapters 1-5, 7-9st. reading and		Methods		Details	_	e grade (%)	Assessment Methods to CLO Mapping	
Required/recommended McDonald, R. L.: Derivatives Markets (Addison Wesley, 2012, 3rd edition), Chapters 1-5, 7-9st. reading and		Assignments				25	CLO 1,2,3	
reading and		Examination One 3-hour written examination 75				75	CLO 1,2,3	
Course Website http://moodle.hku.hk	reading and		, R. L.: Derivatives Mark	tets (Addison Wesley, 2012, 3rd e	edition), Chap	oters 1-5, 7-9st.		

STAT3906	Risk theory I (6 credits)	Academic Year	2020			
Offering Department	Statistics & Actuarial Science	Quota				
Course Co-ordinator	Dr K C Cheung, Statistics & Actuarial Science (kccg@hku.hk)					
Teachers Involved	(Dr K C Cheung, Statistics & Actuarial Science)					
Course Objectives	Risk theory is one of the main topics in actuarial science. Risk theory is the apstochastic processes to insurance problems such as the premium calculation.	pplications of statis	stical models and			
Course Contents & Topics	Severity models; frequency models; collective risk models; coverage modificatio	ns; risk measures				
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 understand the individual risk model and the collective risk model	el, evaluate the	distribution and			

	ex	expectation of the total claim amounts						
		CLO 2 estimate the premium of a policyholder and the total claim amounts using the information of						
		mounts made in previou	. ,	3				
	CLO 3 ca	alculate some commonly	y used risk measures and explain th	eir use and limitation				
Pre-requisites (and Co-requisites and Impermissible combinations)		TAT3903, or already en IATH3603 or STAT3603						
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 2	022 : Y	Examination	Dec			
Grade Descriptors (A+ to F)	A	learning outcomes. Show s	stery at an advanced level of extensive kr strong analytical and critical abilities and log vide range of complex, familiar and unfam	ical thinking, with evidence of ori	ginal thought, and ability			
	В	learning outcomes. Show e	ommand of a broad range of knowledge an evidence of analytical and critical abilities and ons. Apply effective organizational and prese	l logical thinking, and ability to ap				
	С							
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-ba	ased course						
Course Teaching	Activities		Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials				12			
	Reading /	/ Self study			100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignme	ents	Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3			
	Examinat	iion	One 3-hour written examination	75	CLO 1,2,3			
Required/recommended	Klugman	(lugman S. A., Panjer H. H., & Willmot G. E.: Loss Models: From Data to Decisions (John Wiley & Sons, Inc. 2012, 4th edition)						
reading and online materials Course Website		edition)						

STAT3907	Linear r	nodels and forecasti	ing (6 credits)	Academic Yea	r 2020	
Offering Department	Statistics	& Actuarial Science		Quota		
Course Co-ordinator	Dr G Li, S	Statistics & Actuarial Scien	nce (gdli@hku.hk)			
Teachers Involved	(Dr G Li,S	Statistics & Actuarial Scient	nce)			
Course Objectives	through u	ising linear models and tir	me series analysis.	dels and investigates various fore	.	
Course Contents & Topics			regression; predicting; time verage and integrated model	series models including autores; forecasting.	gressive, moving	
Course Learning	On succe	ssful completion of this c	ourse, students should be ab	ele to:		
Outcomes	CLO 1	fit a simple or multiple	e linear regression model to r	eal data		
	CLO 2	do ANOVA analysis				
	CLO 3	identify and fit a suital	ble AR, MA or ARMA model	to real data		
	CLO 4	perform residual anal	ysis			
	CLO 5	do forecasting with the	ese fitted models			
Pre-requisites	Pass in S	TAT2602 or STAT3902.	or already enrolled in this co	urse; and		
and Co-requisites				dy enrolled in this course; and		
and Impermissible				dy enrolled in this course; and		
combinations)	Not for students who have passed in ECON2280, or have already enrolled in this course; and					
	For BSc(/	Actuarial Science) studen	its only.			
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021 - 20	022 : Y	Examination	May	
Grade Descriptors (A+ to F)	A B	learning outcomes. Show str to apply knowledge to a win presentational skills.	rong analytical and critical abilities a de range of complex, familiar and	sive knowledge and skills required for a and logical thinking, with evidence of origi unfamiliar situations. Apply highly effect dge and skills required for attaining at le	nal thought, and abilitive organizational and	
		learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture-b	ased course				
Course Teaching	Activities		Details		No. of Hours	
Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			100	
					100	

				Mapping
	Assignments	Coursework (assignments, tutorials, a computer-based assessment and a class test)	25	CLO 1,2,3,4,5
	Examination	One 3-hour written examination	75	CLO 1,2,3,4,5
Required/recommended reading and online materials	Abraham & J. Ledolter: Statistical	conometric Models and Economic For Methods for Forecasting (John Wiley & Reinsel: Time Series Analysis: Foreca	& Sons, 2005, 2nd edition)
Course Website	http://moodle.hku.hk			

STAT3908	Credibility theory and loss distributions (6 credits) Academic Ye			ear 2020		
Offering Department	Statistics	& Actuarial Science	· ·	Quota		
Course Co-ordinator	Dr A G Be	enchimol, Statistics &	Actuarial Science (benchi@hku.hk)			
Teachers Involved	(Dr A G B	enchimol, Statistics &	Actuarial Science)			
Course Objectives	calculatio	n. Insurance loss va loss is both of theore	of a statistical estimate. The idea aries according to the business nature etical interest and practical importance	e, what distribution shou	uld be used to fit a	
Course Contents	Limited fl	uctuation approach;	Buhlman's approach; Bayesian approa	ach; empirical Bayes par	rameter estimations;	
& Topics	determina		parametric models; properties and esti ility of a fitted model; comparison of fi			
Course Learning	On succe	ssful completion of th	is course, students should be able to:			
Outcomes	CLO 1 ap	oply limited fluctuation	n (classical) credibility including criteria	for both full and partial cr	edibility	
		•	ysis using both discrete and continuous			
	m	odel	Buhlmann-Straub models and understa	•	•	
			in Bayesian analysis and in particular th		el	
			an methods in the nonparametric and s	emiparametric cases		
		onstruct and select er	•			
		•	bility of a fitted model and/or compare n	nodels		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	Pass in STAT2602 or STAT3902 or STAT3906				
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021	- 2022 : Y	Examination	May	
Grade Descriptors (A+ to F)	Α	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.				
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	Demonstrate little or no of analytical and critical	evidence of command of knowledge and skills real abilities, logical and coherent thinking. Show and presentational skills are minimally effective of	equired for attaining the course very little or no ability to ap		
Course Type	Lecture-b	ased course				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading / Self study				100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents	Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3,4,5,6,7	
	Examinat	tion	One 3-hour written examination	75	CLO 1,2,3,4,5,6,7	
Required/recommended reading and online materials	Klugman edition).	S. A., Panjer H. H., &	k Willmot G. E.: Loss Models: From Dat	a to Decisions (John Wile	ey & Sons, 2010, 4th	
Ullille illateriais						

STAT3909	Life contingencies II (6 credits)	Academic Year	2020			
Offering Department	Statistics & Actuarial Science	Quota				
Course Co-ordinator	Dr D Lee, Statistics & Actuarial Science (leedav@hku.hk)					
Teachers Involved	(Dr D Lee, Statistics & Actuarial Science)					
Course Objectives	This course aims at introducing some topics in non-traditional life insurar applications of more advanced theories of life contingencies.	nce. Emphasis wi	ll be placed or			
Course Contents & Topics	This course is a continuation of the materials covered in STAT3901. We shall loss random variable; policy values; expenses and asset shares; multiple state testing.					
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 calculate policy values for life insurances and annuities					
	CLO 2 incorporate expenses in gross premium and calculate policy values based on the gross premium for life					

Required/recommended reading and online materials	Dickson, edition)	tion N. L. et al.: Actuarial Matl	Coursework (assignments, tutorials, a computer-based assessment and a class test) One 3-hour written examination nematics (Society of Actuaries, 1997, Mathematics for Life Contingent Risl	25 75 2nd edition)	to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6 Press, 2013, 2nd		
and Weighting Required/recommended	Examina Bowers, N	tion N. L. et al.: Actuarial Matl	tutorials, a computer-based assessment and a class test) One 3-hour written examination nematics (Society of Actuaries, 1997,	25 75 2nd edition)	Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6		
and Weighting	Examina	tion	tutorials, a computer-based assessment and a class test) One 3-hour written examination	25 75	Mapping CLO 1,2,3,4,5,6		
			tutorials, a computer-based assessment and a class test)	25	Mapping CLO 1,2,3,4,5,6		
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods		
	Reading	/ Self study			100		
-	Tutorials			12			
& Learning Activities	Lectures	*		36			
Course Teaching	Activitie	S	Details		No. of Hours		
Course Type	Lecture-b	ased course	,				
	Fail	knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	D	familiar situations. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most					
	В	learning outcomes. Show ev	mmand of a broad range of knowledge and s ridence of analytical and critical abilities and lo ns. Apply effective organizational and presenta	gical thinking, and ability to appl			
Grade Descriptors (A+ to F)	A	learning outcomes. Show st to apply knowledge to a win presentational skills.	tery at an advanced level of extensive know rong analytical and critical abilities and logical ide range of complex, familiar and unfamiliar	thinking, with evidence of original situations. Apply highly effective	nal thought, and ability ive organizational and		
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021 - 2		Examination	May		
(and Co-requisites and Impermissible combinations)		Pass in STAT3901, or already enrolled in this course; and for BSc(Actuarial Science) students only.					
Pre-requisites		xplain the concept of prof					
		CLO 5 analyze multiple life models and calculate the life insurances and annuities in models with mul					
		CLO 4 analyze multiple decrement models and calculate the life insurances and annuities in models decrements					
			actuarial present values under the m				
	III (CL (C) 31~						

STAT3910	Financia	al economic	s I (6 credits)			Academic Year	2020
Offering Department	Statistics 8	& Actuarial Sci	ence				Quota	
Course Co-ordinator	Prof H L Yang, Statistics & Actuarial Science (hlyang @hku.hk)							
Teachers Involved			& Actuarial Sc					
Course Objectives		se is on optior d risk manager		edging. The c	ourse will conce	entrate on t	he theory and id	ea of derivatives
Course Contents & Topics	time option volatility; the	Option market; European and American options; conditional expectation and discrete-time martingale, discret time option-pricing theory; binomial model and its Greeks; true probabilities vs. risk-neutral probabilities; estimating volatility; the Black-Scholes formula; implied volatility; option Greeks; market-making and hedging; exotic options. For obtaining IFoA credit, the assessment is different. The assessment becomes final exam (60%), midterm teres (10%) and computer-based assignment (30%).						oilities; estimating exotic options.
Course Learning	On succes	ssful completio	n of this course	e, students sho	ould be able to:			
Outcomes	CLO 1 cal	lculate option	price using b	inomial tree,			, American opti	ons, options on
	CLO 2 understand the risk neutral probability, and how to price option using real probability							
	CLO 3 understand the Black-Scholes formula, including the assumptions, the Greek letters, option elasticity, and implied volatility							
	CLO 4 understand the hedging strategies and portfolio, market-maker risk, self-financing portfolio							
	CLO 5 understand the market-maker's profit							
	CLO 6 understand exotic options, including Asian options, barrier options, compound options, gap options, and exchange options							
	CLO 7 understand interest rate models, including Vasicek model, Cox-Ingersoll-Ross model and Black-Derman- Toy model							
Pre-requisites	Pass in ST	TAT2602 or ST	AT3902; and					
(and Co-requisites and Impermissible combinations)		Not for students who have passed in STAT3618, or have already enrolled in this course; and Not for students who have passed in FINA2322, or have already enrolled in this course.						
Offer in 2020 - 2021	Y 1st s	sem Offer in	2021 - 2022 : `	Y			Examination	Dec
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the cours learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and abil to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational are presentational skills.					al thought, and ability		
	В	learning outcom and some unfan	es. Show evidence illiar situations. App	of analytical and ply effective organ	critical abilities and l nizational and preser	logical thinking ntational skills.		knowledge to familia
	С	outcomes. Show	evidence of som	e analytical and		logical thinking	or attaining most of g, and ability to apply	

	Fail	Show evidence of some col knowledge to solve problem Demonstrate little or no evic of analytical and critical al	ut limited command of knowledge and skills required for attaining some of the course learning outcor ne coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to a oblems. Apply limited or barely effective organizational and presentational skills. no evidence of command of knowledge and skills required for attaining the course learning outcomes. I cal abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to so in and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-bas	sed course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading / Self study				100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignmen	ts	Coursework (assignments, tutorials, a computer-based assessment and a class test)	25	CLO 1,2,3,4,5,6,7		
	Examination		One 3-hour written examination	75	CLO 1,2,3,4,5,6,7		
Required/recommended reading and online materials		Derivatives Markets, Chapters 10-14 and 24, 2nd edition, by Robert L. McDonald. Options, Futures and Other Derivatives, 4th or later edition, by J. Hull.					
Course Website	http://moodl	le.hku.hk					

STAT3911	Financia	al economics II (6	credits)	Academic Yea	r 2020		
Offering Department	Statistics & Actuarial Science Quota			Quota			
Course Co-ordinator	Prof H L Yang, Statistics & Actuarial Science (hlyang@hku.hk)						
Teachers Involved	(Prof H L Yang, Statistics & Actuarial Science)						
Course Objectives	This course is an advanced course on the option pricing theory. The course covers Black-Scholes equation and stochastic calculus, and interest models.						
Course Contents & Topics	Brownian motion; introduction to stochastic calculus; arithmetic and geometric Brownian motion; Ito formula; Sharpe ratio and risk premium; Black-Scholes equation; risk-neutral stock-price process and option pricing; option's elasticity and volatility; Vasicek, Cox-Ingersoll-Ross, and Black-Derman-Toy models; delta-hedging for bonds and the Sharpe-ratio equality constraint; Black's model; options on zero-coupon bonds; interest-rate caps and caplets.						
Course Learning	On succes	ssful completion of thi	is course, students should be able to:				
Outcomes	CLO 1	understand Brownia	n motion and its properties				
	CLO 2	understand the Ito ca	alculus and Ito formula				
	CLO 3	understand the Blac	k-Scholes model and option pricing the	eory			
	CLO 4	understand the delta	a hedging and some basic risk manage	ement methods			
	CLO 5	understand some ba	asic interest rate models				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	ATH3603 or STAT36	03 or STAT3903 or STAT3910				
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021	- 2022 : Y	Examination	May		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	С						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures			36			
	Tutorials				12		
	Reading /	/ Self study			100		
Assessment Methods and Weighting	Methods	,	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3,4,5		
	Examination		One 3-hour written examination	75	CLO 1,2,3,4,5		
	Examinat	Robert L. McDonald: Derivatives Markets (2nd edition), Chapters 20, 21 and 24. John Hull: Options, Futures and Other Derivatives (2008, 7th edition) Alison Etheridge: A Course in Financial Calculus (2002) Steven Shreve: Stochastic Calculus for Finance II Continuous-Time Models (2008)					
Required/recommended reading and online materials	Robert L. John Hull: Alison Eth	: Options, Futures and neridge: A Course in F	d Other Derivatives (2008, 7th edition) Financial Calculus (2002)				

STAT3951	Further topics in contingencies (6 credits)	Academic Year	2020
Offering Department	Statistics & Actuarial Science	Quota	

Course Co-ordinator	Dr D Lee, Statistics & Actuarial Science (leedav@hku.hk)						
Teachers Involved	(Dr D Lee	Statistics & Actuarial	Science)				
Course Objectives		This course covers more advanced stochastic models and actuarial techniques used in the field of life and non-life insurance.					
Course Contents & Topics	guarantee		f the multiple state model; graduation r-linked life-contingent insurance prod				
Course Learning	On succe	ssful completion of th	is course, students should be able to:				
Outcomes	de	ependent cash flows	abilities in continuous-time multiple	state models and evalu	ate expected state		
			nt transition probabilities				
			graduation and apply statistical tests f	, ,	ons		
			sform on probability distributions and				
			ked insurance products using Esscher				
		•	nodels and evaluate ruin probabilities	as well as related quantitie	S		
Pre-requisites (and Co-requisites and Impermissible	Pass in S	TAT3909; and TAT3910, or already Actuarial Science) stu	enrolled in this course; and dents only.				
combinations)							
Offer in 2020 - 2021		fer in 2021 - 2022 : Y		Examination			
Grade Descriptors (A+ to F)	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the co- learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and a to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational presentational skills.					
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the cours learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familia and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. La of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-b	ased course					
Course Teaching	Activities	S	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials				12		
	Reading	/ Self study			100		
Assessment Methods and Weighting	Methods	•	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3,4,5,6		
	Examinat		One 3-hour written examination	75	CLO 1,2,3,4,5,6		
Required/recommended reading and online materials	Subject C	CS2 Risk Modelling	thematics for Life Contingent Risks (Cand Survival Analysis, Core Princip		ute and Faculty of		
		Actuaries, 2018) Lecture notes on equity linked insurance products and simple dividend-ruin models.					
	Lecture no	otes on equity linked i	insurance products and simple divider	nd-ruin models.			

STAT3952	Investment and asset management (6 credits)	Academic Year	2020				
Offering Department	Statistics & Actuarial Science	Quota					
Course Co-ordinator	TBC, Statistics & Actuarial Science ()						
Teachers Involved	(TBC,Statistics & Actuarial Science)						
Course Objectives	in the management of an investment portfolio. Emphasis will be placed on r	The main objective of this course is to introduce students to some of the methods and procedures commonly used in the management of an investment portfolio. Emphasis will be placed on methods to tackle problems faced by insurance industry such as investment strategy formulation and interest rate risk management.					
Course Contents & Topics		This course provides an overview on the problems faced by actuaries when applying fundamental actuarial concepts to investment practice. This course will cover the following topics: Investment Management Process,					
Course Learning	On successful completion of this course, students should be able to:						
Outcomes	CLO 1 explain how an investment policy and an investment strategy can help manage risk						
	CLO 2 identify the obligations of a fiduciary in managing investment portfolios						
	CLO 3 describe how to select an investment strategy for an individual and the particular issues influencing investment strategies for institutional investors						
	CLO 4 explain principles of risk-based capital management						
	CLO 5 describe asset allocation strategies that can be used to construct an asset portfolio						
	CLO 6 identify and describe financial and non-financial risks faced by an entity						
	CLO 7 define risk metrics to quantify major types of risk exposure, apply ALM principles to the establishment of investment policy and strategy						
	CLO 8 select or build a benchmark for a given portfolio or portfolio management style, describe and assess performance measurement methodologies for investment portfolios						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in STAT3901; and Not for students who have passed in FINA2320, or have already enrolled in this course; and For BSc(Actuarial Science) students only.						
Offer in 2020 - 2021	N Offer in 2021 - 2022 : N	Examination					
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge a learning outcomes. Show strong analytical and critical abilities and logical thinking						

		to apply knowledge to a wi	ide range of complex, familiar and unfamiliar	situations. Apply highly effect	tive organizational and		
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least mo learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply know and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but in outcomes. Show evidence of	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge. Apply moderately effective organizational and presentational skills.				
	D	Show evidence of some coh	ted command of knowledge and skills required terent and logical thinking, but with limited analy s. Apply limited or barely effective organizationa	tical and critical abilities. Show			
	Fail	Demonstrate little or no evid of analytical and critical ab	idence of command of knowledge and skills required for attaining the course learning outcomes. L abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to so d presentational skills are minimally effective or ineffective.				
Course Type	Lecture-l	pased course					
Course Teaching	Activitie	es	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials			12			
	Reading / Self study			100			
Assessment Methods and Weighting	Method	s	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		Assignments, tutorials/example classes, group discussions, project and presentation	50	CLO 1,2,3,4,5,6,7,8		
	Examination		One 2-hour written examination	50	CLO 1,2,3,4,5,6,7,8		
Required/recommended reading and online materials	Z. Bodie, Crouhy, F. J. Fab	D. Babbel & F. J. Fabozzi: Investment Management for Insurers (Frank J. Fabozzi & Assoc., 1999) E. Bodie, A. Kane, & A. Marcus: Investments (McGraw-Hill, 2005, 7th edition) Crouhy, Galai, & Mark: Risk Management (2001) E. J. Fabozzi: Handbook of Fixed Income Securities (McGraw-Hill, 2005, 7th edition) itterman: Modern Investment Management: An Equilibrium Approach (2003)					
Course Website				,			
Additional Course Information	Dynamic	Process (Wiley, 2007, 3r	o://moodle.hku.hk ner references: J. L. Maginn, D.L. Tuttle, J.E. Pinto & D.W. McLeavey: Managing Investment Portfolios, A namic Process (Wiley, 2007, 3rd edition) man: Asset / Liability Management of Financial Institutions (2003)				

	Funda	mentals of actua	rial practice (6 credits)	Academic Yea	r 2020		
Offering Department		s & Actuarial Science		Quota			
Course Co-ordinator	Dr A G E	Dr A G Benchimol, Statistics & Actuarial Science (benchi@hku.hk)					
Teachers Involved	(Dr A G	(Dr A G Benchimol, Statistics & Actuarial Science)					
Course Objectives	This cou	This course teaches students about the business environment and exposes them to practical real-world situations					
•	using the	e actuarial control cy	cle as a framework.				
Course Contents & Topics	Actuary, placed of	This course provides an overview on selected materials relating to the following topics: Role of the Professiona Actuary, External Forces, Risk in Actuarial Problems, Design and Pricing of Actuarial Solutions. Emphasis will be placed on applications to various financial security programmes including individual life insurance, group insurance social security plans, retirement plans, investment funds and property and casualty insurance.					
Course Learning			this course, students should be able				
Outcomes	CLO 1		description of financial security syst		ques and practica		
	CLO 2	describe actuarial pr	actices, principles, approaches, meth	nods, commonalities, problems	and solutions		
			ctices across the traditional areas of				
		explain actuarial pra consultant to those p	actices as applied directly on behalt providers	If of financial security system	providers or as a		
	CLO 5 apply actuarial skills in nontraditional and emerging areas of practice						
	CLO 6 provide context for the specific mathematical and technical skills developed in the basic actuarial courses						
	CLO 7 prepare for the professional role as an Associate of the Society of Actuaries						
and Impermissible combinations)							
			21 - 2022 : Y	Examination	No Exam		
Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Y 1:	Demonstrate thorough	21 - 2022 : Y gh mastery at an advanced level of extension Show strong analytical and critical abilities and to a wide range of complex, familiar and un	ve knowledge and skills required for a d logical thinking, with evidence of orig	attaining all the cours inal thought, and abili		
Grade Descriptors		Demonstrate thoroug learning outcomes. Sto apply knowledge presentational skills. Demonstrate substat learning outcomes. St	gh mastery at an advanced level of extensions of the strong analytical and critical abilities and to a wide range of complex, familiar and untial command of a broad range of knowledges of wide analytical and critical abilities.	we knowledge and skills required for a d logical thinking, with evidence of orig nfamiliar situations. Apply highly effect e and skills required for attaining at less and logical thinking, and ability to app	attaining all the cours inal thought, and abili tive organizational an ast most of the cours		
Grade Descriptors	A	Demonstrate thoroug learning outcomes. S to apply knowledge presentational skills. Demonstrate substar learning outcomes. S and some unfamiliar Demonstrate genera outcomes. Show evi	gh mastery at an advanced level of extensions Show strong analytical and critical abilities and to a wide range of complex, familiar and un ntial command of a broad range of knowledge	we knowledge and skills required for a d logical thinking, with evidence of orig nfamiliar situations. Apply highly effect e and skills required for attaining at less and logical thinking, and ability to app presentational skills. Ind skills required for attaining most and logical thinking, and ability to ap	attaining all the cours inal thought, and abili- tive organizational an ast most of the cours by knowledge to famili- of the course learnin		
Grade Descriptors	В	Demonstrate thorouglearning outcomes. Sto apply knowledge presentational skills. Demonstrate substant learning outcomes. Store unfamiliar Demonstrate genera outcomes. Show evifamiliar situations. Aft Demonstrate partial Show evidence of so	gh mastery at an advanced level of extensions strong analytical and critical abilities and to a wide range of complex, familiar and untial command of a broad range of knowledgehow evidence of analytical and critical abilities situations. Apply effective organizational and libut incomplete command of knowledge a dence of some analytical and critical abilities poly moderately effective organizational and probut limited command of knowledge and skills me coherent and logical thinking, but with limited.	we knowledge and skills required for a digical thinking, with evidence of orignfamiliar situations. Apply highly effecte and skills required for attaining at less and logical thinking, and ability to appresentational skills. In skills required for attaining most and logical thinking, and ability to appresentational skills. The service of the service of the countries of the co	attaining all the cours inal thought, and abili- ive organizational an ast most of the cours ly knowledge to famili- of the course learnin ply knowledge to mo rse learning outcome		
Grade Descriptors	B C	Demonstrate thoroug learning outcomes. Sto apply knowledge presentational skills. Demonstrate substal learning outcomes. Sand some unfamiliar Demonstrate genera outcomes. Show evifamiliar situations. Ag Demonstrate partial Show evidence of so knowledge to solve p Demonstrate little or of analytical and cri	gh mastery at an advanced level of extension strong analytical and critical abilities and to a wide range of complex, familiar and untial command of a broad range of knowledge show evidence of analytical and critical abilities situations. Apply effective organizational and libut incomplete command of knowledge a dence of some analytical and critical abilities poly moderately effective organizational and probut limited command of knowledge and skills me coherent and logical thinking, but with lim problems. Apply limited or barely effective organo evidence of command of knowledge and stitual abilities, logical and coherent thinking.	we knowledge and skills required for a digical thinking, with evidence of orignfamiliar situations. Apply highly effect and skills required for attaining at less and logical thinking, and ability to appresentational skills. In the skills required for attaining most as and logical thinking, and ability to apresentational skills. In the skills required for attaining most as and logical thinking, and ability to apresentational skills. In the skills required for attaining some of the coult and analytical and critical abilities. Show inizational and presentational skills, skills required for attaining the course less show very little or no ability to app	attaining all the cours inal thought, and abili- ive organizational an ast most of the cours ly knowledge to famili- of the course learnin ply knowledge to mo- rse learning outcome w limited ability to app		
Grade Descriptors (A+ to F)	B C D	Demonstrate thoroug learning outcomes. Sto apply knowledge presentational skills. Demonstrate substal learning outcomes. Sand some unfamiliar Demonstrate genera outcomes. Show evifamiliar situations. Ag Demonstrate partial Show evidence of so knowledge to solve p Demonstrate little or of analytical and cri	gh mastery at an advanced level of extensions strong analytical and critical abilities and to a wide range of complex, familiar and untial command of a broad range of knowledge show evidence of analytical and critical abilities situations. Apply effective organizational and but incomplete command of knowledge a dence of some analytical and critical abilities poly moderately effective organizational and pubut limited command of knowledge and skills me coherent and logical thinking, but with lim problems. Apply limited or barely effective organ o evidence of command of knowledge and set on evidence of command of knowledge and set of the set of	we knowledge and skills required for a digical thinking, with evidence of orignfamiliar situations. Apply highly effect and skills required for attaining at less and logical thinking, and ability to appresentational skills. In the skills required for attaining most as and logical thinking, and ability to apresentational skills. In the skills required for attaining most as and logical thinking, and ability to apresentational skills. In the skills required for attaining some of the coult and analytical and critical abilities. Show inizational and presentational skills, skills required for attaining the course less show very little or no ability to app	attaining all the cours inal thought, and abili- ive organizational an ast most of the cours ly knowledge to famili- of the course learnin ply knowledge to mo rse learning outcome w limited ability to app		
Grade Descriptors (A+ to F) Course Type	B C D	Demonstrate thoroug learning outcomes. Sto apply knowledge presentational skills. Demonstrate substant learning outcomes. Sto and some unfamiliar Demonstrate genera outcomes. Show evifamiliar situations. Ag Demonstrate partial Show evidence of so knowledge to solve pomonstrate little or of analytical and criproblems. Organizati-bassed course	gh mastery at an advanced level of extension strong analytical and critical abilities and to a wide range of complex, familiar and untial command of a broad range of knowledge show evidence of analytical and critical abilities situations. Apply effective organizational and libut incomplete command of knowledge a dence of some analytical and critical abilities poly moderately effective organizational and probut limited command of knowledge and skills me coherent and logical thinking, but with lim problems. Apply limited or barely effective organo evidence of command of knowledge and stitual abilities, logical and coherent thinking.	we knowledge and skills required for a digical thinking, with evidence of orignfamiliar situations. Apply highly effect and skills required for attaining at less and logical thinking, and ability to appresentational skills. In the skills required for attaining most as and logical thinking, and ability to apresentational skills. In the skills required for attaining most as and logical thinking, and ability to apresentational skills. In the skills required for attaining some of the coult and analytical and critical abilities. Show inizational and presentational skills, skills required for attaining the course less show very little or no ability to app	attaining all the coursinal thought, and abilitive organizational are ast most of the coursely knowledge to familiate for the course learningly knowledge to most learning outcome with limited ability to appearing outcomes. Larely knowledge to solve		
Grade Descriptors (A+ to F) Course Type Course Teaching	B C D Fail Lecture- Activiti	Demonstrate thoroug learning outcomes. Sto apply knowledge presentational skills. Demonstrate substant learning outcomes. Sand some unfamiliar Demonstrate genera outcomes. Show evifamiliar situations. Ag Demonstrate partial Show evidence of so knowledge to solve pomonstrate little or of analytical and criproblems. Organizati-based course	gh mastery at an advanced level of extensions strong analytical and critical abilities and to a wide range of complex, familiar and untial command of a broad range of knowledge show evidence of analytical and critical abilities situations. Apply effective organizational and if but incomplete command of knowledge a dence of some analytical and critical abilities poly moderately effective organizational and probut limited command of knowledge and skills me coherent and logical thinking, but with lim problems. Apply limited or barely effective organo evidence of command of knowledge and skills mo evidence of command of knowledge and stical abilities, logical and coherent thinking, onal and presentational skills are minimally effective organical contents.	we knowledge and skills required for a digical thinking, with evidence of orignfamiliar situations. Apply highly effect and skills required for attaining at less and logical thinking, and ability to appresentational skills. In the skills required for attaining most as and logical thinking, and ability to apresentational skills. In the skills required for attaining most as and logical thinking, and ability to apresentational skills. In the skills required for attaining some of the coult and analytical and critical abilities. Show inizational and presentational skills, skills required for attaining the course less show very little or no ability to app	attaining all the coursinal thought, and abilitive organizational an ast most of the coursely knowledge to familiate of the course learningly knowledge to most learning outcome with limited ability to appearing outcomes. Lacily knowledge to solvino. Of Hours		
Grade Descriptors (A+ to F) Course Type Course Teaching	B C D Fail	Demonstrate thoroug learning outcomes. Sto apply knowledge presentational skills. Demonstrate substant learning outcomes. So and some unfamiliar Demonstrate genera outcomes. Show evifamiliar situations. At Demonstrate partial Show evidence of so knowledge to solve poemonstrate little or of analytical and criproblems. Organizati	gh mastery at an advanced level of extensions strong analytical and critical abilities and to a wide range of complex, familiar and untial command of a broad range of knowledge show evidence of analytical and critical abilities situations. Apply effective organizational and if but incomplete command of knowledge a dence of some analytical and critical abilities poly moderately effective organizational and probut limited command of knowledge and skills me coherent and logical thinking, but with lim problems. Apply limited or barely effective organo evidence of command of knowledge and skills mo evidence of command of knowledge and stical abilities, logical and coherent thinking, onal and presentational skills are minimally effective organical contents.	we knowledge and skills required for a digical thinking, with evidence of orignfamiliar situations. Apply highly effect and skills required for attaining at less and logical thinking, and ability to appresentational skills. In the skills required for attaining most as and logical thinking, and ability to apresentational skills. In the skills required for attaining most as and logical thinking, and ability to apresentational skills. In the skills required for attaining some of the coult and analytical and critical abilities. Show inizational and presentational skills, skills required for attaining the course less show very little or no ability to app	attaining all the coursinal thought, and abilitive organizational an ast most of the coursely knowledge to familiate of the course learningly knowledge to most learning outcome which is applied to the course learning outcomes. Lately knowledge to solv		
Grade Descriptors	B C D Fail Lecture- Activiti Lecture Project	Demonstrate thoroug learning outcomes. Sto apply knowledge presentational skills. Demonstrate substant learning outcomes. So and some unfamiliar Demonstrate genera outcomes. Show evifamiliar situations. At Demonstrate partial Show evidence of so knowledge to solve poemonstrate little or of analytical and criproblems. Organizati	gh mastery at an advanced level of extensions strong analytical and critical abilities and to a wide range of complex, familiar and untial command of a broad range of knowledge show evidence of analytical and critical abilities situations. Apply effective organizational and if but incomplete command of knowledge a dence of some analytical and critical abilities poly moderately effective organizational and probut limited command of knowledge and skills me coherent and logical thinking, but with lim problems. Apply limited or barely effective organo evidence of command of knowledge and skills mo evidence of command of knowledge and stical abilities, logical and coherent thinking, onal and presentational skills are minimally effective organical contents.	we knowledge and skills required for a digical thinking, with evidence of orignfamiliar situations. Apply highly effect and skills required for attaining at less and logical thinking, and ability to appresentational skills. In the skills required for attaining most as and logical thinking, and ability to apresentational skills. In the skills required for attaining most as and logical thinking, and ability to apresentational skills. In the skills required for attaining some of the coult and analytical and critical abilities. Show inizational and presentational skills, skills required for attaining the course less show very little or no ability to app	attaining all the cours inal thought, and abilitive organizational ar ast most of the cours by knowledge to famility of the course learning by knowledge to mo rise learning outcome w limited ability to appearing outcomes. Lac by knowledge to solv No. of Hours 36		

and Weighting			course grade (%)	Methods to CLO Mapping
	Presentation	oral presentation	25	CLO 4,5,6
	Project reports	written report	50	CLO 4,5,6,7
	Test	in-class quizzes	25	CLO 1,2,3,4,5,6,7
Required/recommended reading and online materials	Bellis, C., Klugman, S., S Cycle (Institute of Actuarie Brown, R.L. and Gottliel Insurance (ACTEX Public	ng Actuarial Practice (Society of Actua hepherd, J., and Lyon, R.: Understan es of Australia, 2010, 2nd ed.) o, L.R.: Introduction to Ratemaking ations, Inc., 2007, 3rd ed.) e of Enterprise Risk Management: The	ding Actuarial Management: 1 and Loss Reserving for Pro	perty and Casualty
Course Website	http://moodle.hku.hk			

STAT3954	Current	topics in actuar	ial science (6 credits)	Academic Yea	ar 2020		
Offering Department		& Actuarial Science		Quota			
Course Co-ordinator	TBC, Stati	stics & Actuarial Sc	sience ()				
Teachers Involved			V				
Course Objectives	This course aims at providing practical elements for actuarial students including daily life actuarial practice and the basic capability to understand, research in and handle the laws as and when situations would arise, which we benefit students in their coming future career.						
Course Contents & Topics		se covers a full rai Legal Thinking.	nge of topics related to both areas incl	uding 1) Practical Actuar	ial Practice and 2)		
	Insurance	, it covers the full and Experience Ar	ice: It covers the major practical topics picture of actuarial control cycle inclualysis. For General Insurance, it covers to	uding Product Pricing, V	aluation, Financial		
	changes in legal mate course, al	n the market for ba erials with heavy ir ongside with basio	This is the 7th year of the course and the sic legal and general insurance skills for the solvement of actuarial and other general legal research skills and fundamental rance Industry would also infiltrate the co	or actuaries. Intellectually ral insurance expertise w legal thinking. Sharing o	stimulating recent ould dominate the		
Course Learning	On succes	ssful completion of t	his course, students should be able to:				
Outcomes	CLO 1 ha	ive a basic underst	anding regarding Actuarial Control Cycle	from A to Z for Life Insu	rance and General		
		surance					
			ence regarding fundamental actuarial pra		oject		
			tanding of the legal system in Hong Kon	-			
	CLO 4 possess fundamental knowledge in certain core legal aspects such as the law of contract and the law of tort						
	CLO 5 possess fundamental knowledge of the law of insurance						
	CLO 6 conduct elementary legal researches when facing with legal problems						
	CLO 7 understand the basic elements of a routine judgment, the matrix of the facts and the law involved						
Pre-requisites			y enrolled in this course; or	ix or the racte and the law	IIIVOIVOU		
(and Co-requisites			y enrolled in this course; and				
and Impermissible		ctuarial Science) st	•				
combinations)		,	,·				
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : N	N	Examination			
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack						
	Fail	of analytical and criti	o evidence of command of knowledge and skills recal abilities, logical and coherent thinking. Show n and presentational skills are minimally effective o	very little or no ability to app			
Course Type		ased course					
Course Teaching	Activities	.	Details		No. of Hours 36		
& Learning Activities	Lectures						
	Tutorials				12		
		Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	Coursework (assignments, practical project & class test(s))	100	CLO 1,2,3,4,5,6,7		
		dle.hku.hk	, ,(9))		1		

STAT3955	Survival analysis (6 credits)	Academic Year	2020
Offering Department	Statistics & Actuarial Science	Quota	
Course Co-ordinator	Dr J F Xu, Statistics & Actuarial Science (xujf@hku.hk)		
Teachers Involved	(Dr J F Xu, Statistics & Actuarial Science)		
Course Objectives	This course is concerned with how models which predict the survival pattern	n of humans or c	other entities are

& Topics include: the ir commonly use survival distrity from possibly kernel density means of the regression mode	troduction of some d parametric surviv			opics to be covered		
Outcomes CLO 1 acquir conce CLO 2 perfor mecha CLO 3 analyz CLO 4 exten Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Reading D Delea and C D Delea and C D Delea and C D Delea and C D Delea and C D Delea and C D Delea and C D Delea and C D Delea and C D D D D D D D D D D D D D D D D D D	The nature and properties of parametric and nonparametric survival models will be studied. Topics to be covered include: the introduction of some important basic quantities like the hazard function and survival function; some commonly used parametric survival models; concepts of censoring and/or truncation; parametric estimation of the survival distribution by maximum likelihood estimation method; nonparametric estimation of the survival functions from possibly censored samples by means of the Kaplan-Meier estimator, the Nelson-Aalen estimator; and the kernel density estimator or the Ramlau-Hansen estimator and comparisons of k independent survival functions by means of the generalized log-rank test; parametric regression models; Cox's semiparametric proportional hazards regression model; and multivariate survival analysis.					
CLO 2 performecha CLO 3 analyz CLO 4 extend Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) B De lea and C De Sh knd Fail De Course Type Course Type Course Teaching & Learning Activities Activities Lectures Tutorials Reading / Sel Methods Assignments		course, students should be able to:				
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) B De lea and C De out fant D De Course Type Course Teaching & Learning Activities Assessment Methods and Weighting CLO 3 analyz Pass in STAT Not for studen Not for studen C De lea and C De lea And C De out fant D De Activities Lecture-based Activities Lectures Tutorials Reading / Sel Assignments	CLO 1 acquire a clear understanding of the nature of failure time data or survival data, a general concept of death and life CLO 2 perform estimation for some commonly used survival models under different types					
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) B De lea and C De out fant D De Sh knt Fail De Course Type Course Teaching & Learning Activities Curse Seaching Activities Assessment Methods and Weighting CLO 4 extend Pass in STAT Not for student Not for student Not for student D De lea and C De out fant D De Sh knt Fail De Course Type Activities Lecture-based Activities Lectures Tutorials Reading / Sel Methods Assignments		g the Cox's semiparametric proporti	onal hazards model	•		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) B De lea and Co-pressible to pression of the combinations of the		a multivariate setup to accommoda		ta		
Offer in 2020 - 2021 Grade Descriptors (A+ to F) B De lea an C De Sh kn Fail De of pro Course Type Course Teaching & Learning Activities Activities Lectures Tutorials Reading / Sel Assignments	3600 or STAT3901;	rolled in this course; or d in STAT3955, or already enrolled in	n this course.			
Grade Descriptors (A+ to F) B Delea and C Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D Delea and D D Delea and D D Delea and D D D D D D D D D D D D D D D D D D D	2021 - 2022 : N		Examination			
C De out fan D De Sh. knt Fail De of pro Course Type Lecture-based Course Teaching & Learning Activities Lectures Tutorials Reading / Sel Assessment Methods and Weighting Methods Assignments						
C De out fan D De Sh. known Fail De of pro Course Type						
Course Type Course Teaching & Learning Activities Lectures Tutorials Reading / Sel Assessment Methods and Weighting Assignments	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
Course Type Course Teaching & Learning Activities Lecture-based Activities Lectures Tutorials Reading / Sel Assessment Methods and Weighting Lectures Methods Assignments	Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lac of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve					
Course Teaching & Learning Activities Lectures Tutorials Reading / Sel Assessment Methods and Weighting Activities Lectures Methods Reading / Sel Assignments		presentational skills are minimally effective of	or ineffective.			
& Learning Activities Lectures Tutorials Reading / Sel Assessment Methods and Weighting Lectures Methods Reading / Sel Assignments	Course	Details		No. of Hours		
Assessment Methods and Weighting Reading / Sel Methods Assignments		Dotalio		36		
Assessment Methods and Weighting Methods Assignments				12		
Assessment Methods and Weighting Methods Assignments	study			100		
	·	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
		Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3,4		
Examination		One 3-hour written examination 75		CLO 1,2,3,4		
reading and Hosmer, D. Woonline materials 1999) Klein, J. P. ar	. and Lemeshow, S	is of Survival Data (Chapman and H 3.: Applied Survival Analysis: Regree 1. L.: Survival Analysis: Techniques	ssion Modeling of Time to	, ,		
Course Website http://moodle.l	,					

STAT3956	Pensio	n funds and pension mathematics (6 credits)	Academic Year	2020			
Offering Department	Statistics	s & Actuarial Science	Quota				
Course Co-ordinator	Prof G M	Prof G Ma, Statistics & Actuarial Science (gma328@hku.hk)					
Teachers Involved	(Prof G I	(Prof G Ma, Statistics & Actuarial Science)					
Course Objectives	of pension	This course covers the basics of pension plan design and pension fund management, as well as the fundamentals of pension plan valuations using different actuarial cost methods. The students will be introduced to the application of actuarial valuation techniques to the funding and accounting of pension plans.					
Course Contents & Topics	The follo	The following topics will be covered: Fundamentals of private pension plans; pricing and valuation of pension obligations; actuarial cost methods and their effects on cost patterns; selection of actuarial assumptions; principles of asset and liability management.					
Course Learning	On succ	essful completion of this course, students should be able to:					
Outcomes	CLO 1	calculate the pension benefits in accordance with the provisions	of a pension plan				
	CLO 2 calculate the normal cost and actuarial liabilities using different actuarial cost methods						
	CLO 3 perform gain and loss analyses for pension valuations						
	CLO 4 select appropriate assumptions and methods for funding or accounting purposes						
	CLO 5 interpret the valuation results presented in actuarial valuation reports						
	CLO 6 understand the principles of asset and liability modeling as related to pension plans						
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in STAT3909; and For BSc(Actuarial Science) students only.					
Offer in 2020 - 2021	N O	ffer in 2021 - 2022 : Y	Examination				
Grade Descriptors (A+ to F)	Α	Demonstrate thorough mastery at an advanced level of extensive knowled learning outcomes. Show strong analytical and critical abilities and logical th to apply knowledge to a wide range of complex, familiar and unfamiliar si presentational skills.	inking, with evidence of origina	al thought, and ability			
	В	Demonstrate substantial command of a broad range of knowledge and skill- learning outcomes. Show evidence of analytical and critical abilities and logical and some unfamiliar situations. Apply effective organizational and presentation	al thinking, and ability to apply				

	С	outcomes. Show evidence	incomplete command of knowledge and sk of some analytical and critical abilities and oderately effective organizational and present	logical thinking, and ability to a		
	D	Show evidence of some col	ited command of knowledge and skills requi herent and logical thinking, but with limited a ns. Apply limited or barely effective organizati	nalytical and critical abilities. Sh		
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course le of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to appl problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-b	ased course				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignments		Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3,4,5,6	
	Examination		One 3-hour written examination	75	CLO 1,2,3,4,6	
Required/recommended reading and online materials	Arthur W. Anderson: Pension Mathematics for Actuaries (2006, 3rd edition). McGill, D.M., Brown, K.N., Haley, J.J., Schieber, S.J.: Fundamentals of Private Pensions (2010, 9th Edition) William H. Aitken: Problem-Solving Approach to Pension Funding and Valuation, (2nd edition). Morneau Sobeco: Handbook of Canadian Pension & Benefit Plans (2016, 16th Edition) Actuarial Standard of Practice No. 27, Selection of Economic Assumptions for Measuring Pension Obligations Actuarial Standard of Practice No. 35, Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations Actuarial Standard of Practice No. 44, Selection and Use of Asset Valuation Methods for Pension Valuations David Farber, ASA, EA, MSPA, William Farrimond, FSPA, Duane Mayer, MSPA, George Matray, FSPA: Actuarial Cost Methods-A Review, 3rd Edition, 1999, ACTEX Publications 2001 Supplement to Actuarial Cost Methods-A Review, ACTEX Publications Ma C M George: Fundamentals of Pension Funds and Pension Mathematics. Peking University Press (2015)					
Course Website		odle.hku.hk	i rension runus and Pension Mathe	emancs. Feking University	y F1655 (2013)	
Jourse Hensile	Tittp://IIIOC	AIC.TINU.TIN				

STAT4601	Time-seri	ies analysis (6 cre	edits)	A	cademic Year	2020
Offering Department	Statistics &	Actuarial Science		Q	uota	
Course Co-ordinator	Dr G Li, Sta	atistics & Actuarial Sc	cience (gdli@hku.hk)			
Teachers Involved	(Dr G Li,Sta	atistics & Actuarial Sc	cience)			
Course Objectives	climatology series are different typ	A time series consists of a set of observations on a random variable taken over time. Time series arise naturally in climatology, economics, environment studies, finance and many other disciplines. The observations in a time series are usually correlated; the course establishes a framework to discuss this. This course distinguishes different type of time series, investigates various representations for the processes and studies the relative merits of different forecasting procedures. Students will analyse real time-series data on the computer.				
Course Contents & Topics	,	Stationarity and the autocorrelation functions; linear stationary models; linear non-stationary modes; models identification; estimation and diagnostic checking; seasonal models and forecasting methods for time series.				
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 rec	ognize a stationary v	s non-stationary time series			
		derstand some basic oving average) and A	properties of commonly used t RMA models	time series models su	uch as AR (aut	toregressive), MA
			y time series into stationary one			
			ries models based on autocorr			
			ARMA model to real data using	g SAS (after transforr	ming to station	arity if necessary)
			tests for such models			
	CLO 7 do forecasting with these fitted time series models					
•	Pass in ST	AT3600; and	ed in STAT3614, or have alrea	ady enrolled in this co	ourse; and	
(and Co-requisites and Impermissible combinations)	Pass in STA Not for stud Not for stud	AT3600; and dents who have passe dents who have passe	ed in STAT3614, or have alrea ed in STAT3907, or have alrea	ndy enrolled in this co	urse.	May
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	Pass in STA Not for stud Not for stud Y 2nd	AT3600; and dents who have passedents who have passedents who have passedem Offer in 2021 -	ed in STAT3614, or have alrea ed in STAT3907, or have alrea - 2022 : Y	edy enrolled in this co	urse. camination	Мау
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021	Pass in ST. Not for stud Not for stud Y 2nd	AT3600; and dents who have passedents who have passes sem Offer in 2021 - Demonstrate thorough m learning outcomes. Show	ed in STAT3614, or have alrea ed in STAT3907, or have alrea	dy enrolled in this co Expressive knowledge and skill and logical thinking, with	warse. kamination Is required for attention of origin	taining all the course nal thought, and ability
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Pass in ST. Not for stud Not for stud Y 2nd	AT3600; and dents who have passedents through meaning outcomes. Show to apply knowledge to a presentational skills. Demonstrate substantial learning outcomes. Show	ed in STAT3614, or have alreated in STAT3907, or have alreated in STAT3907, or have alreated and a state of the state of the strong analytical and critical abilities wide range of complex, familiar and command of a broad range of knowle evidence of analytical and critical abilities.	dy enrolled in this co Expansive knowledge and skill and logical thinking, with a unfamiliar situations. Appendix and skills required fittes and logical thinking, a	camination Is required for attevidence of origin oply highly effective or attaining at lea	taining all the course hal thought, and ability we organizational and last most of the course
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in ST. Not for stuc Not for stuc Y 2nd	AT3600; and dents who have passedents and personal skills. Demonstrate substantial learning outcomes. Show and some unfamiliar situal personal but outcomes. Show evidence	ed in STAT3614, or have alreated in STAT3907, or have alreated in STAT3907, or have alreated and a strong analytical and critical abilities wide range of complex, familiar and command of a broad range of knowled evidence of analytical and critical abilitions. Apply effective organizational at incomplete command of knowledge of some analytical and critical abilitions.	ady enrolled in this co Expansive knowledge and skill and logical thinking, with d unfamiliar situations. Ap- edge and skills required for ities and logical thinking, and nd presentational skills. e and skills required for ties and logical thinking,	curse. kamination Is required for attevidence of origin opply highly effective or attaining at lea and ability to apply attaining most of	taining all the course nal thought, and ability we organizational and list most of the course knowledge to familiar of the course learning
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in ST. Not for stuc Not for stuc Y 2nd: A B	AT3600; and dents who have passedents outcomes. Show and some unfamiliar situations. Apply robemonstrate partial but in Demonstrate partial but is show evidence of some company to the partial partial but is show evidence of some company to the partial partial but is show evidence of some company to the partial partia	ed in STAT3614, or have alreated in STAT3907, or have alreated in STAT3907, or have alreated at an advanced level of externity at an advanced level of externity at an advanced level of externity analytical and critical abilities wide range of complex, familiar and command of a broad range of knowle evidence of analytical and critical abilitations. Apply effective organizational at incomplete command of knowledgr	ady enrolled in this co Expansive knowledge and skill and logical thinking, with d unfamiliar situations. Ap- edge and skills required for ities and logical thinking, and nd presentational skills. e and skills required for ties and logical thinking, and d presentational skills. idlis required for attaining limited analytical and critic	Aurse. Kamination Is required for attevidence of origin oply highly effective or attaining at lea and ability to apply attaining most of and ability to app some of the cours cal abilities. Show	taining all the course nal thought, and ability we organizational and ust most of the course knowledge to familiar of the course learning by knowledge to most se learning outcomes.
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in ST. Not for stuc Not for stuc Y 2nd A B C D	AT3600; and dents who have passedents who apply knowledge to a presentational skills. Demonstrate substantial learning outcomes. Show and some unfamiliar situations. Apply robemonstrate partial but list is show evidence familiar situations. Apply robemonstrate partial but list Show evidence of some cknowledge to solve problemonstrate little or no evidence of analytical and critical	ed in STAT3614, or have alreated in STAT3907, or have alreated in STAT3907, or have alreated in STAT3907, or have alreated and action and an advanced level of extensions analytical and critical abilities wide range of complex, familiar and command of a broad range of knowled evidence of analytical and critical abilitions. Apply effective organizational at incomplete command of knowledge of some analytical and critical abilitimoderately effective organizational an imited command of knowledge and shotherent and logical thinking, but with	ndy enrolled in this co Expressive knowledge and skill and logical thinking, with d unfamiliar situations. Ap- edge and skills required for tites and logical thinking, and presentational skills. e and skills required for ties and logical thinking, d presentational skills. itills required for attaining limited analytical and critic rganizational and present d skills required for attain ng. Show very little or n	Aurse. kamination Is required for attevidence of origin poly highly effective or attaining at lea and ability to apply attaining most of and ability to app some of the cours al abilities. Show attional skills. ing the course lea	taining all the course nal thought, and ability we organizational and st most of the course y knowledge to familiar f the course learning ly knowledge to most se learning outcomes. limited ability to apply arning outcomes. Lack
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Pass in ST. Not for stuc Not for stuc Y 2nd A B C D	AT3600; and dents who have passedents who apply knowledge to a presentational skills. Demonstrate substantial learning outcomes. Show and some unfamiliar situations. Apply robemonstrate partial but limble to some cknowledge to solve proble Demonstrate little or no ed analytical and critical problems. Organization ar	ed in STAT3614, or have alreated in STAT3907, or have alreated in STAT3907, or have alreated in STAT3907, or have alreated and all all all all all all all all all al	ndy enrolled in this co Expansive knowledge and skill and logical thinking, with d unfamiliar situations. Ap- edge and skills required for tites and logical thinking, and presentational skills. e and skills required for ties and logical thinking, d presentational skills. itills required for attaining limited analytical and critic riganizational and present d skills required for attain ng. Show very little or n	Aurse. kamination Is required for attevidence of origin poly highly effective or attaining at lea and ability to apply attaining most of and ability to app some of the cours al abilities. Show attional skills. ing the course lea	taining all the course nal thought, and ability we organizational and st most of the course y knowledge to familiar f the course learning ly knowledge to most se learning outcomes. limited ability to apply arning outcomes. Lack
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Pass in ST. Not for stuc Not for stuc Y 2nd: A B C D Fail	AT3600; and dents who have passedents who apply knowledge to a presentational skills. Demonstrate substantial learning outcomes. Show and some unfamiliar situations. Apply robemonstrate partial but limble to some cknowledge to solve proble Demonstrate little or no ed analytical and critical problems. Organization ar	ed in STAT3614, or have alreated in STAT3907, or have alreated in STAT3907, or have alreated in STAT3907, or have alreated and all all all all all all all all all al	ndy enrolled in this co Expansive knowledge and skill and logical thinking, with d unfamiliar situations. Ap- edge and skills required for tites and logical thinking, and presentational skills. e and skills required for ties and logical thinking, d presentational skills. itills required for attaining limited analytical and critic riganizational and present d skills required for attain ng. Show very little or n	Aurse. kamination Is required for attevidence of origin poly highly effective or attaining at lea and ability to apply attaining most of and ability to app some of the cours al abilities. Show attional skills. ing the course lea	taining all the course nal thought, and ability we organizational and st most of the course y knowledge to familiar f the course learning ly knowledge to most se learning outcomes. limited ability to apply arning outcomes. Lack
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Pass in STA Not for stuce Not for stuce Y 2nd: A B C D Fail Lecture-bas	AT3600; and dents who have passedents who apply knowledge to a presentational skills. Demonstrate substantial learning outcomes. Show and some unfamiliar situations. Apply robemonstrate partial but limble to some cknowledge to solve proble Demonstrate little or no ed analytical and critical problems. Organization ar	ed in STAT3614, or have alreaded in STAT3907, or have alreaded in	ndy enrolled in this co Expansive knowledge and skill and logical thinking, with d unfamiliar situations. Ap- edge and skills required for tites and logical thinking, and presentational skills. e and skills required for ties and logical thinking, d presentational skills. itills required for attaining limited analytical and critic riganizational and present d skills required for attain ng. Show very little or n	Aurse. kamination Is required for attevidence of origin poly highly effective or attaining at lea and ability to apply attaining most of and ability to app some of the cours al abilities. Show attional skills. ing the course lea	taining all the course nal thought, and ability ve organizational and lest most of the course y knowledge to familiar of the course learning ly knowledge to most se learning outcomes. limited ability to apply arming outcomes. Lack y knowledge to solve
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Pass in STA Not for stuce Not for stuce Y 2nd: A B C D Fail Lecture-bas Activities	AT3600; and dents who have passedents who apply knowledge to a presentational skills. Demonstrate substantial learning outcomes. Show and some unfamiliar situations. Apply robemonstrate partial but limble to some cknowledge to solve proble Demonstrate little or no ed analytical and critical problems. Organization ar	ed in STAT3614, or have alreaded in STAT3907, or have alreaded in	ndy enrolled in this co Expansive knowledge and skill and logical thinking, with d unfamiliar situations. Ap- edge and skills required for tites and logical thinking, and presentational skills. e and skills required for ties and logical thinking, d presentational skills. itills required for attaining limited analytical and critic riganizational and present d skills required for attain ng. Show very little or n	Aurse. kamination Is required for attevidence of origin poly highly effective or attaining at lea and ability to apply attaining most of and ability to app some of the cours al abilities. Show attional skills. ing the course lea	taining all the course nal thought, and ability we organizational and lest most of the course y knowledge to familiar of the course learning lest knowledge to most se learning outcomes. I limited ability to apply arming outcomes. Lack y knowledge to solve
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Pass in STA Not for stud Not for stud Y 2nd: A B C D Fail Lecture-bas Activities Lectures	AT3600; and dents who have passedents have passedents who have pas	ed in STAT3614, or have alreaded in STAT3907, or have alreaded in	ndy enrolled in this co Expansive knowledge and skill and logical thinking, with d unfamiliar situations. Ap- edge and skills required for tites and logical thinking, and presentational skills. e and skills required for ties and logical thinking, d presentational skills. itills required for attaining limited analytical and critic riganizational and present d skills required for attain ng. Show very little or n	Aurse. kamination Is required for attevidence of origin poly highly effective or attaining at lea and ability to apply attaining most of and ability to app some of the cours al abilities. Show attional skills. ing the course lea	taining all the course all thought, and ability we organizational and ast most of the course of knowledge to familiar of the course learning only knowledge to most see learning outcomes. I limited ability to apply arming outcomes. Lack of knowledge to solve No. of Hours 36

	Assignments	tutorials, and a class test)	40	CLO 1,2,3,4,5,6,7		
	Examination	One 2-hour written examination	60	CLO 1,2,3,4,6,7		
Required/recommended reading and online materials	Bovas Ábraham & Johannes Ledo W. W .S. Wei: Time Series Analysi W. K. Li: Diagnostic Checks in Tim	ies Analysis with Applications in R (Iter: Statistical Methods for Forecas is: Univariate and Multivariate Metho ne Series (Chapman & Hall/CRC, 20 ies: A Dynamical System Approach	ting (John Wiley & Sons, ods (Addison-Wesley, 20 04)	2005, 2nd edition) 06, 2nd edition)		
Course Website	http://moodle.hku.hk					

STAT4602	Multivar	iate data analysis (6	credits)	Academic Yea	r 2020	
Offering Department	Statistics 8	& Actuarial Science	•	Quota	50	
Course Co-ordinator	Prof T W I	K Fung, Statistics & Actu	arial Science (wingfung@hku.hk)			
Teachers Involved	(Prof T W K Fung, Statistics & Actuarial Science)					
Course Objectives	In many designed experiments or observational studies, the researchers are dealing with multivariate data, where each observation is a set of measurements taken on the same individual. These measurements are ofter correlated. The correlation prevents the use of univariate statistics to draw inferences. This course develops the statistical methods for analysing multivariate data through examples in various fields of application and hands-or experience with the statistical software SAS.					
Course Contents & Topics	Problems with multivariate data. Multivariate normality and transforms. Mean structure for one sample. Tests o covariance matrix. Correlations: Simple, partial, multiple and canonical. Multivariate regression. Principal components analysis. Factor analysis. Problems for means of several samples. Multivariate analysis of variance. Discriminant analysis. Classification. Multivariate linear model.					
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 analyze multivariate data with main SAS procedures, such as PROC IML PROC CANCORR, PROC PRINCOMP, PROC FACTOR, PROC DISCRIM,					
		mpare the mean struc ultivariate MANOVA and	ture of multiple measurements for profile analysis	or one or more than one	population(s) by	
	со	rrelation and multivariate				
	an	alysis and factor analysi				
			oopulation with one or more than or	ne measurements by discrir	ninant analysis	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	「AT3600 or STAT3907				
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2	022 : Y	Examination	May	
Grade Descriptors (A+ to F)	A	learning outcomes. Show st	tery at an advanced level of extensive knor rong analytical and critical abilities and logic de range of complex, familiar and unfamil	cal thinking, with evidence of origi	nal thought, and ability	
	В	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.				
	D					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type		ased course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials	0 15 / 1			12	
	-	Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignments		Coursework (assignments, tutorials, and a class test)	40	CLO 1,2,3,4,5	
	-		One 3-hour written examination	60	CLO 1,2,3,4,5	
Required/recommended reading and online materials	·					
	Srivastava	M. S.: Methods of Multi	variate Statistics (John Wiley and S		l, 2006, 6th edition	

STAT4603	Current topics in risk management (6 credits)	Academic Year	2020
Offering Department	Statistics & Actuarial Science	Quota	
Course Co-ordinator	Dr O T K Choi, Statistics & Actuarial Science (ochoi@hku.hk)		
Teachers Involved	(Dr O T K Choi, Statistics & Actuarial Science)		
Course Objectives	This course is to broaden the students knowledge of risk management by management. These topics will build on the theory and methods covered in the each year depend on staff availability.		
Course Contents	Liquidity risk; Operational risk; Model risk; Enterprise risk management; Cutting	edge risk analytics	s and innovations

& Topics	in risk mar	n risk management.					
Course Learning	On succes	ssful completion of th	is course, students should be able to:				
Outcomes	CLO 1	gain insights into cur	rent advances in risk management				
	CLO 2	understand current r	isk management pitfalls and development	t			
	CLO 3	make effective use of	of models and techniques for managing va	arious kinds of risk			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in (STAT3618 or FINA2322)						
Offer in 2020 - 2021	Y 1st	Y 1st sem Offer in 2021 - 2022 : Y Examination Dec					
Grade Descriptors (A+ to F)	Α	learning outcomes. Sho	mastery at an advanced level of extensive knowle w strong analytical and critical abilities and logical t a wide range of complex, familiar and unfamiliar	thinking, with evidence of orig	inal thought, and ability		
	В	learning outcomes. Sho	Il command of a broad range of knowledge and sk w evidence of analytical and critical abilities and logi uations. Apply effective organizational and presentat	ical thinking, and ability to app			
	С	outcomes. Show evider	ut incomplete command of knowledge and skills nce of some analytical and critical abilities and logi moderately effective organizational and presentation	ical thinking, and ability to ap			
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
		knowledge to solve prod	olems. Apply limited or barely effective organizationa	al and presentational skills.			
	Fail	Demonstrate little or no of analytical and critical	olems. Apply limited or barely effective organizationa evidence of command of knowledge and skills requ al abilities, logical and coherent thinking. Show vi and presentational skills are minimally effective or in	ired for attaining the course le ery little or no ability to app			
Course Type		Demonstrate little or no of analytical and critical	evidence of command of knowledge and skills requal abilities, logical and coherent thinking. Show ve	ired for attaining the course le ery little or no ability to app			
		Demonstrate little or no of analytical and critica problems. Organization ased course	evidence of command of knowledge and skills requal abilities, logical and coherent thinking. Show ve	ired for attaining the course le ery little or no ability to app			
Course Teaching	Lecture-ba	Demonstrate little or no of analytical and critica problems. Organization ased course	evidence of command of knowledge and skills requal abilities, logical and coherent thinking. Show wand presentational skills are minimally effective or in	ired for attaining the course le ery little or no ability to app	ly knowledge to solve		
Course Teaching	Lecture-ba	Demonstrate little or no of analytical and critica problems. Organization ased course	evidence of command of knowledge and skills requal abilities, logical and coherent thinking. Show wand presentational skills are minimally effective or in	ired for attaining the course le ery little or no ability to app	No. of Hours		
Course Type Course Teaching & Learning Activities	Lecture-ba Activities Lectures Tutorials	Demonstrate little or no of analytical and critica problems. Organization ased course	evidence of command of knowledge and skills requal abilities, logical and coherent thinking. Show wand presentational skills are minimally effective or in	ired for attaining the course le ery little or no ability to app	No. of Hours		
Course Teaching	Lecture-ba Activities Lectures Tutorials	Demonstrate little or no of analytical and critice problems. Organization ased course	evidence of command of knowledge and skills requal abilities, logical and coherent thinking. Show wand presentational skills are minimally effective or in	ired for attaining the course le ery little or no ability to app	No. of Hours 36 12		
Course Teaching & Learning Activities Assessment Methods	Lecture-ba Activities Lectures Tutorials Reading /	Demonstrate little or no of analytical and critical problems. Organization assed course	evidence of command of knowledge and skills requal abilities, logical and coherent thinking. Show wand presentational skills are minimally effective or in	uired for attaining the course le ery little or no ability to app neffective. Weighting in final	No. of Hours 36 12 100 Assessment Methods		
Course Teaching & Learning Activities Assessment Methods	Lecture-ba Activities Lectures Tutorials Reading / Methods	Demonstrate little or no of analytical and critical problems. Organization assed course Self study	evidence of command of knowledge and skills requal abilities, logical and coherent thinking. Show wand presentational skills are minimally effective or in Details Details	uired for attaining the course leave little or no ability to appreffective. Weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping		
Course Teaching & Learning Activities Assessment Methods	Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati Dowd, K: I Fiedler, R. Franzetti, Basel Coi	Demonstrate little or no of analytical and critical problems. Organization assed course is a Self study Self study Ents Measuring Market Ri .: Liquidity Modelling. C.: Operational Risk mmittee on Banking	evidence of command of knowledge and skills requal abilities, logical and coherent thinking. Show wand presentational skills are minimally effective or in Details	weighting in final course grade (%) Weighting in final course grade (%) 50 50 14, 16)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3 es, 2010)		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and	Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati Dowd, K: I Fiedler, R. Franzetti, Basel Cor standards Basel Cor banking sy	Demonstrate little or no of analytical and critical problems. Organization assed course is a Self study Self study Ents In Measuring Market Ri is Liquidity Modelling. C.: Operational Risk mmittee on Banking and monitoring (BIS)	evidence of command of knowledge and skills requal abilities, logical and coherent thinking. Show wand presentational skills are minimally effective or in Details	weighting in final course grade (%) Weighting in final course grade (%) 50 50 14, 16) Hall/CRC Finance Seriamework for liquidity respective.	No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3 es, 2010) risk measurement,		

STAT4606	Risk management and Basel Accords in banking and fina (6 credits)	ance	Academic Year	2020		
Offering Department	Statistics & Actuarial Science		Quota			
Course Co-ordinator	Mr P K Y Pang, Statistics & Actuarial Science (the_pang@yahoo.com)					
Teachers Involved	(Mr P K Y Pang, Statistics & Actuarial Science)	,				
Course Objectives	To provide comprehensive knowledge and in-depth understanding of industry to students. The focus is on management with basic measure course. Accordingly, minimal background in quantitative methods will financial product (eg: bonds, swaps, options) knowledge will be require	ement fun II be requ	damentals only for	ming a part of the		
Course Contents & Topics	The course introduces and explains: - the importance of risk management, - risk nature and types, - design and establishment of a risk management framework, - the importance of people and corporate culture, - the complete risk management cycle, - measurement and management of credit, market and operational risk - Basel accords and the capital treatments for credit, market and operational risk - key developments (eg: Know-Your-Customers, Anti-Money launderin) - the importance of business continuity, - design and implementation of a business continuity plan.	ks, ational ris		ical issues,		
Course Learning Outcomes	- design and implementation of a business continuity plan. On successful completion of this course, students should be able to: CLO 1 understand the importance, nature and classification of various risks, and the risk management and cycle CLO 2 design and establish a risk management framework CLO 3 demonstrate knowledge and understanding of the measurements of credit, market and operation CLO 4 explain and describe Basel accords and its capital treatments for credit, market and operational CLO 5 appreciate the importance of, design and implement a business continuity plan					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in STAT3618 or STAT3910 or STAT3905 or (FINA2322 and any	Universi	ty level 3 course)			
Offer in 2020 - 2021	N Offer in 2021 - 2022 : N		Examination			
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive kno learning outcomes. Show strong analytical and critical abilities and logica to apply knowledge to a wide range of complex, familiar and unfamilia presentational skills.	al thinking,	with evidence of origina	I thought, and ability		

	В	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familia and some unfamiliar situations. Apply effective organizational and presentational skills.				
	С		of some analytical	and critical abilities and l	lls required for attaining most ogical thinking, and ability to a ational skills.	
	D	Show evidence of some cohe	erent and logical tl	ninking, but with limited an	ed for attaining some of the co alytical and critical abilities. Sh anal and presentational skills.	
	Fail	knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge problems. Organization and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	3	Details			No. of Hours
& Learning Activities	Lectures					36
	Tutorials	Tutorials			12	
	Reading / Self study					100
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		Coursework tutorials, and	(assignments, a class test)	40	CLO 1,2,3,4
	Examination		One 2-hour written examination 60		CLO 1,2,3,4,5	
Required/recommended reading and online materials	Crouhy, M., Galai, D. and Mark, R.: The Essentials of Risk Management (McGraw-Hill, 2006) Jorion, P.: Financial Risk Manager Handbook + Test Bank: FRM part I/Part II (Wiley, 2010, 6th edition) Hull, J. C.: Risk Management and Financial Institutions (Pearson Higher Education, 2010, 2nd edition) Gallati, R.: Risk Management and Capital Adequacy (McGrawHill, 2003)					
Course Website	http://moo	dle.hku.hk				
Additional Course Information	This cours	se is previously called ST	AT2320 as the	prerequisite change	d to STAT3303.	

STAT4607	Credit r	isk analysis (6 cr	redits)	Academic Yea	ar 2020		
Offering Department		& Actuarial Science	,	Quota			
Course Co-ordinator	Dr K P W	at, Statistics & Actua	arial Science (watkp@hku.hk)	'	'		
Teachers Involved	(Dr K P V	Vat,Statistics & Actua	arial Science)				
Course Objectives	other cou change in measurin	For a commercial bank, credit risk has always been the most significant. It is the risk of default on debt, swap, o other counterparty instruments. Credit risk may also result from a change in the value of an asset resulting from a change in the counterparty's creditworthiness. This course will introduce students to quantitative models for measuring and managing credit risk. It also aims to provide students with an understanding of the credit risk methodology used in the financial industry and the regulatory framework in which the credit risk models operate.					
Course Contents & Topics	Probabilit internal r	ies of default, recov	very rates and loss given default; Defa it portfolio models such as CreditMetr	ault and credit migration;	credit scoring and		
Course Learning	On succe	ssful completion of the	his course, students should be able to:				
Outcomes	CLO 1 u	nderstand the Basel	requirements for credit risk				
	CLO 2 e	stimate credit scores	using the logit model				
		nderstand and estimentality method	nate default probabilities using various	approaches such as Moo	ody's KMV and the		
	CLO 4 u	nderstand the conce	pt of credit value-at-risk and the CreditN	letrics approach			
	CLO 5 es	stimate default corre	lations				
	CLO 6 as	ssess rating systems	3				
Pre-requisites and Co-requisites and Impermissible combinations)	Pass in S	TAT3618 or STAT39	905 or STAT3910 or (FINA2322 and any	y University level 3 course)		
Offer in 2020 - 2021	Y 2nd	d sem Offer in 202	Y 2nd sem Offer in 2021 - 2022 : Y Examination May				
	A Demonstrate thorough learning outcomes. She to apply knowledge to presentational skills. B Demonstrate substant						
Grade Descriptors (A+ to F)		Demonstrate thorough learning outcomes. Sh to apply knowledge to presentational skills. Demonstrate substanti learning outcomes. She	mastery at an advanced level of extensive knows trong analytical and critical abilities and logic of a wide range of complex, familiar and unfamilial command of a broad range of knowledge and ow evidence of analytical and critical abilities and	owledge and skills required for cal thinking, with evidence of original iar situations. Apply highly effect skills required for attaining at la logical thinking, and ability to app	attaining all the course ginal thought, and abilit ctive organizational and east most of the course		
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Grade Descriptors (A+ to F)	В	Demonstrate thorough learning outcomes. Sh to apply knowledge to presentational skills. Demonstrate substanti learning outcomes. Sh and some unfamiliar si Demonstrate general outcomes. Show evide familiar situations. App Demonstrate partial bu. Show evidence of som	mastery at an advanced level of extensive know strong analytical and critical abilities and logic or a wide range of complex, familiar and unfamilial command of a broad range of knowledge and ow evidence of analytical and critical abilities and tuations. Apply effective organizational and preser but incomplete command of knowledge and skence of some analytical and critical abilities and ly moderately effective organizational and present at limited command of knowledge and skills require coherent and logical thinking, but with limited and	owledge and skills required for cal thinking, with evidence of original situations. Apply highly effect I skills required for attaining at leading to a still still sequired for attaining at leading to approximate the still sequired for attaining most logical thinking, and ability to approximate the still sequired for attaining most logical thinking, and ability to approximate the still sequired for attaining some of the countried for attaining some of the countried for attaining some of the countries.	attaining all the course ginal thought, and abilit citive organizational and east most of the course oly knowledge to familia of the course learning oply knowledge to mos urse learning outcomes		
	В	Demonstrate thorough learning outcomes. Sh to apply knowledge to presentational skills. Demonstrate substanti learning outcomes. Sho and some unfamiliar sit Demonstrate general outcomes. Show evide familiar situations. App Demonstrate partial but Show evidence of som knowledge to solve propending the properties of the propending the	mastery at an advanced level of extensive know strong analytical and critical abilities and logic of a wide range of complex, familiar and unfamilial command of a broad range of knowledge and ow evidence of analytical and critical abilities and tuations. Apply effective organizational and preset but incomplete command of knowledge and sence of some analytical and critical abilities and ly moderately effective organizational and present at limited command of knowledge and skills requi	owledge and skills required for call thinking, with evidence of originar situations. Apply highly effect I skills required for attaining at leading to be still skills. It is still sequired for attaining most logical thinking, and ability to approximate the still sequired for attaining most logical thinking, and ability to approximate the still still sequired for attaining some of the conallytical and critical abilities. Sho onal and presentational skills. equired for attaining the course I were juited for attaining the juited for attaining the course I were juited for attaining the juited for	attaining all the course ginal thought, and ability tive organizational and east most of the course oly knowledge to familia of the course learning oply knowledge to mos urse learning outcomes we limited ability to apply earning outcomes. Laci		
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Course Type	B C D	Demonstrate thorough learning outcomes. Sh to apply knowledge to presentational skills. Demonstrate substanti learning outcomes. Sho and some unfamiliar situations. App Demonstrate peneral outcomes. Show evide familiar situations. App Demonstrate partial bu. Show evidence of som knowledge to solve pro Demonstrate little or nof analytical and critic problems. Organizationassed course	mastery at an advanced level of extensive know strong analytical and critical abilities and logic of a wide range of complex, familiar and unfamilial command of a broad range of knowledge and ow evidence of analytical and critical abilities and tuations. Apply effective organizational and preset but incomplete command of knowledge and skance of some analytical and critical abilities and ly moderately effective organizational and present at limited command of knowledge and skills require coherent and logical thinking, but with limited arbiblems. Apply limited or barely effective organization of evidence of command of knowledge and skills read abilities, logical and coherent thinking. Show	owledge and skills required for call thinking, with evidence of originar situations. Apply highly effect I skills required for attaining at leading to be still skills. It is still sequired for attaining most logical thinking, and ability to approximate the still sequired for attaining most logical thinking, and ability to approximate the still still sequired for attaining some of the conallytical and critical abilities. Sho onal and presentational skills. equired for attaining the course I were little or no ability to approximate the sequired for attaining the course I were little or no ability to approximate the sequired for attaining the course I were little or no ability to approximate the sequired for attaining the course I were little or no ability to approximate the sequired for attaining the sequired for attainin	attaining all the course ginal thought, and ability tive organizational and east most of the course oly knowledge to familia of the course learning opply knowledge to mos urse learning outcomes we limited ability to apply earning outcomes. Laci		
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Course Type Course Teaching & Learning Activities Assessment Methods	B C D Fail Lecture-b Activitie Lectures Tutorials	Demonstrate thorough learning outcomes. Sh to apply knowledge to presentational skills. Demonstrate substanti learning outcomes. Sh and some unfamiliar sit Demonstrate general outcomes. Show evide familiar situations. App Demonstrate partial bushow evidence of som knowledge to solve pro Demonstrate little or no of analytical and critic problems. Organization assed course s	mastery at an advanced level of extensive know strong analytical and critical abilities and logic of a wide range of complex, familiar and unfamilial command of a broad range of knowledge and ow evidence of analytical and critical abilities and tuations. Apply effective organizational and preser but incomplete command of knowledge and skence of some analytical and critical abilities and ly moderately effective organizational and present til limited command of knowledge and skills require coherent and logical thinking, but with limited an oblems. Apply limited or barely effective organization of evidence of command of knowledge and skills real abilities, logical and coherent thinking. Shown and presentational skills are minimally effective or	owledge and skills required for call thinking, with evidence of originar situations. Apply highly effect I skills required for attaining at leading to be still skills. It is still sequired for attaining most logical thinking, and ability to approximate the still sequired for attaining most logical thinking, and ability to approximate the still still sequired for attaining some of the conallytical and critical abilities. Sho onal and presentational skills. equired for attaining the course I were little or no ability to approximate the sequired for attaining the course I were little or no ability to approximate the sequired for attaining the course I were little or no ability to approximate the sequired for attaining the course I were little or no ability to approximate the sequired for attaining the sequired for attainin	attaining all the course in all thought, and abilit titive organizational and east most of the course oly knowledge to familia of the course learning oply knowledge to most urse learning outcomes we limited ability to apple earning outcomes. Lacoly knowledge to solve No. of Hours 36 12 100 Assessment Methods		
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reading and online materials	Models to Capital Allocation Policies. Wiley. Saunders, A. and Allen, L. (2010). Credit Risk Measurement In and Out of the Financial Crisis: New Approaches to Value at Risk and Other Paradigms (3rd Edition). Wiley. Loffler, G. and Posch, P. N. (2010). Credit Risk Modeling using Excel and VBA (2nd Edition). Wiley. Jorion, P. (2011). Financial Risk Manager Handbook (6th Edition). Wiley. Crouhy, M., Galai, D., and Mark, R. (2001). Risk Management. McGraw-Hill. Hull, J. C. (2015). Risk Management and Financial Institutions (4th Edition). Wiley. Hull, J. C. (2015). Options, Futures, and Other Derivatives (9th Edition). Prentice Hall. Gujarati, D. N. and Porter, D. C. (2009). Basic Econometrics (5th Edition). McGraw-Hill. Bohn, J. R. and Stein, R. M. (2009). Active Credit Portfolio Management in Practice. Wiley. Smithson, C. W. (2003). Credit Portfolio Management. Wiley.
Course Website	http://moodle.hku.hk

STAT4608	Market r	isk analysis (6 cred	its)	Academic Year	2020	
Offering Department	Statistics 8	& Actuarial Science		Quota		
Course Co-ordinator	Dr K Zhu,	Statistics & Actuarial Sc	ience (mazhuke@hku.hk)			
Teachers Involved	(Dr K Zhu,	Statistics & Actuarial Sc	ience)			
Course Objectives	methods f techniques stress test	Financial risk management has experienced a revolution in the last decade thanks to the introduction of new methods for measuring risk, particularly Value-at-Risk (VaR). This course introduces modern risk management echniques covering the measurement of market risk using VaR models and financial time series models, and stress testing.				
Course Contents & Topics	factor map	Risk Measures; Value-at-Risk (VaR) models (parametric, Monte Carlo simulation and Historical simulation); Ris actor mapping; Advanced VaR models (GARCH-type models, extreme-value theory and normal-mixture); Princip Component Analysis and VaR; Backtesting and stress testing.				
Course Learning	On succes	sful completion of this c	ourse, students should be able to:			
Outcomes	CLO 1	understand VaR and	expected shortfall as risk measures	3		
	CLO 2	O 2 compute VaR and expected shortfall				
	CLO 3	model volatility using	GARCH-type models			
	CLO 4	understand extreme-	value theory			
	CLO 5	understand backtest	ing and stress testing			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S1	AT3907 and STAT3910 AT4601 and (FINA2320	or STAT3609)	-		
Offer in 2020 - 2021 Grade Descriptors	Y 2nd	sem Offer in 2021 - 2	022 : Y tery at an advanced level of extensive kno	Examination	May	
(A+ to F)	В	learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	familiar situations. Apply moderately effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack					
	Fail	of analytical and critical ab problems. Organization and	ence of command of knowledge and skills re- ilities, logical and coherent thinking. Show presentational skills are minimally effective c	very little or no ability to apply		
Course Type	_	ised course				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
		Self study			100	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	nts	Coursework (assignments, tutorials, and a class test)	40	CLO 1,2,3,4,5	
	Examinati	on	One 2-hour written examination	60	CLO 1,2,3,4,5	
Required/recommended reading and online materials	Alexander Alexander Alexander	Examination One 2-hour written examination 60 CLO Jorion, P.: Value-at-Risk: The New Benchmark for Managing Financial Risk (McGraw-Hill, 2007, 3rd edit Alexander, C.: Market Models: A Guide to Financial Data Analysis (Wiley, 2001) Alexander, C.: Market Risk Analysis: Practical Financial Econometrics (Wiley, 2008) Alexander, C.: Market Risk Analysis: Value-at-Risk Models (Wiley, 2009) Tsay, R. S.: Analysis of Financial Time Series (Wiley, 2005, 2nd edition)			3rd edition)	
Course Website	http://mood	dle.hku.hk				

STAT4609	Big data analytics (6 credits)	Academic Year	2020
Offering Department	Statistics & Actuarial Science	Quota	50
Course Co-ordinator	Dr M Zhang, Statistics & Actuarial Science (mzhang18@hku.hk)		
Teachers Involved	(Dr M Zhang, Statistics & Actuarial Science)		
Course Objectives	In the past decade, huge volume of data with highly complicated structure has social web logs, e-mails, video, speech recordings, photographs, tweets and valuable information from these data sources becomes a challenging task. The knowledge and skills of some advanced analytics and statistical modeling for so	others. The effici	ent extraction of on the practical
Course Contents & Topics	Recommender systems, Link analysis, Social network analysis, Text ana modeling, Deep Learning, and Reinforcement learning	lytics, Sentiment	analysis, Topic
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 understand and apply a wide range of data analytic techniques, an	id recognize their	characteristics,

	st	trengths and weaknes	ses			
			ence of computer software for data ar	nalytics		
	CLO 3 id	lentify and use appro	priate data analytic techniques for during the discove	data extraction, taking in	to account both the	
	CLO 4 ev	valuate the quality of	discovered knowledge, taking into a nd the goals of the user		of the data analytic	
Pre-requisites (and Co-requisites and Impermissible combinations)		TAT3612 or STAT490				
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021	- 2022 : Y	Examination	No Exam	
Grade Descriptors (A+ to F)	A	learning outcomes. Show to apply knowledge to a presentational skills.	mastery at an advanced level of extensive kinds with strong analytical and critical abilities and log a wide range of complex, familiar and unfamiliar and unfamiliar and unfamiliar and unfamiliar and unfamiliar and unfami	gical thinking, with evidence of o niliar situations. Apply highly eff	riginal thought, and abilit ective organizational and	
	В	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	Demonstrate little or no of analytical and critica	evidence of command of knowledge and skills I abilities, logical and coherent thinking. Sho and presentational skills are minimally effective	required for attaining the course ow very little or no ability to a		
Course Type	Lecture-b	ased course				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Lectures					
	Tutorials				12	
	Reading	/ Self study			100	
Assessment Methods and Weighting	Methods	3	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignme	ents		30	CLO 1,2,3,4	
	Project re	eports	May include project proposal and presentation	30	CLO 1,2,3,4	
	Test			40	CLO 3,4	
Required/recommended reading and online materials	Technique Aggarwal Sarkar, D	es to Build Intelligent , C.C. (2016). Recomi . (2016). Text Analytic	Machine Learning with Scikit-Learn, Systems. 2nd edition, O'Reilly Media. mender Systems: The Textbook. Spri se with Python. Apress.		oncepts, Tools, and	
Course Website		odle.hku.hk	ng with Python. MANNING.			
Jourse WEDSILE	mup.//iiioc	Juic.iiku.iik				

STAT4610	Bayesian learning (6 credits) Academic You			r 2020			
Offering Department	Statistics & Actuarial Science Quota			Quota			
Course Co-ordinator	, Statistic	, Statistics & Actuarial Science (uq enquiry@saas.hku.hk)					
Teachers Involved			, , , , , , , , , , , , , , , , , , , ,				
Course Objectives		This course aims to introduce Bayesian methodologies and computational techniques of Markov Chain Monte Carlo, and application in the deep learning.					
Course Contents & Topics							
Course Learning Outcomes	On succ	essful completion of	f this course, students should be	able to:			
Pre-requisites (and Co-requisites and Impermissible combinations)							
Offer in 2020 - 2021	N O	offer in 2021 - 2022 :	Υ	Examination			
Grade Descriptors (A+ to F)	A	learning outcomes. S to apply knowledge presentational skills.	Show strong analytical and critical abilitie to a wide range of complex, familiar a	tensive knowledge and skills required for a es and logical thinking, with evidence of orig nd unfamiliar situations. Apply highly effect	inal thought, and abilitive organizational an		
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail	of analytical and cri		and skills required for attaining the course leading. Show very little or no ability to apply effective or ineffective.			
Course Type	Lecture-	based course					
Course Teaching	Activitie	es	Details		No. of Hours		
Learning Activities	Lectures	S			36		
	Tutorials				12		
	Reading	g / Self study			100		
Assessment Methods and Weighting	Method	Is	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mappin		

Assignments	Coursework (assignments, tutorials, and class test(s))	25	
Examination		75	

STAT4710	Capsto	ne experience toi	r statistics undergraduates (6 c	reuits)	Academic Year	2020	
Offering Department		& Actuarial Science	5 (1.1	,	Quota	50	
Course Co-ordinator	Prof G Y	in. Statistics & Actuar	rial Science (ug_enquiry@saas.hku.hk	()	1 - 1 - 1 - 1	1	
Teachers Involved		/in,Statistics & Actuar	, 6= , ,	,			
Course Objectives	This proj problems research	This project-based course aims to provide students with capstone experience to formulate and investigate real life problems in the area of statistics, risk management, finance, climate, social science, medicine and scientific research by integrating and applying the statistical theories and quantitative techniques learnt in their junior university years.					
Course Contents & Topics	groups o two to the	of four or five under the ree weeks before the	are expected to devote 120-140 hour e supervision of a teacher. Students a end of the semester, and submit their	are required final report	d to give a presental at the end of the s	ation on their work semester.	
	students variable(presenta regarding	to equip with hands s) of interest, literatur tion of the results. S	to establish a good and solid founda s-on experience in solving real life p re search, model formulation, data ans Students will need to find an interestir search related to the problem, make s fied in their project.	roblems sta alysis or sir ng topic of	arting from identifi nulation, technical their own, conduc	cation of the key report writing and t literature search	
Course Learning	On succe	essful completion of tl	his course, students should be able to	:			
Outcomes	a	and determine ways i predictions	using statistical or risk management in which statistics/risk management correctice, and to understand limitations	an be used	to solve the prob	•	
			collaborate with people with different				
				baonground	•		
	CLO 5 d	CLO 4 express ideas effectively in both written and oral forms CLO 5 develop further logical, critical thinking, creativity, technical report writing, communication and consultation skills					
	CLO 6 advocate to others the appreciation of statistics/risk management as to its relevance to our daily life						
Pre-requisites	Students	are expected to h	nave satisfactorily completed at least	st 24 cred	its of advanced	level disciplinary	
and Co-requisites and Impermissible	Students core/electaking the This cap mutually	s are expected to heative courses in the Decourse should subnostone course is only exclusive with STAT	nave satisfactorily completed at lead decision Analytics/Risk Management/S nit their applications to the Departmen y for students majoring in Decision 3799, STAT4766 and STAT4799.	st 24 cred statistics Ma t. Analytics/F	its of advanced ajors. Students who Risk Management/	level disciplinary o are interested ir	
(and Co-requisites and Impermissible combinations)	Students core/electaking the This cap mutually The earli	s are expected to hetive courses in the Decourse should subnostone course is only exclusive with STAT sest that a student is a	nave satisfactorily completed at lead decision Analytics/Risk Management/S nit their applications to the Departmen y for students majoring in Decision 3799, STAT4766 and STAT4799. allowed to take this capstone course is	st 24 cred statistics Ma t. Analytics/F	its of advanced ajors. Students who Risk Management/ 3 study.	level disciplinary o are interested in Statistics, and is	
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(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Students core/elect taking the This cap mutually The earli Y 1s	s are expected to hetive courses in the Decourse should subnostone course is only exclusive with STAT set that a student is a streem. It sem 2nd sem On Demonstrate thorough learning outcomes. Should be substantilly be substantilly expressed to a poly knowledge to presentational skills.	nave satisfactorily completed at lear decision Analytics/Risk Management/Strict their applications to the Departmenty for students majoring in Decision 3799, STAT4766 and STAT4799. Allowed to take this capstone course is allowed to take this capstone course is a mastery at an advanced level of extensive the low strong analytical and critical abilities and low a wide range of complex, familiar and unfartial command of a broad range of knowledge a low evidence of analytical and critical abilities are	st 24 cred statistics Ma t. Analytics/F their year cnowledge and gical thinking, niliar situation and skills required logical think	its of advanced ajors. Students who ajors. Students who ask Management/ 3 study. Examination do skills required for at with evidence of origins. Apply highly effective for attaining at leading, and ability to apply	level disciplinary or are interested in Statistics, and is No Exam taining all the course hal thought, and ability we organizational and lest most of the course for the course statement of the course statement of the course or an interest of the course or are interest.	
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(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Students core/electaking the This cap mutually The earli Y 1s B C D Fail	s are expected to hetive courses in the Decourse should subnostone course is only exclusive with STAT5 est that a student is at sem 2nd sem O Demonstrate thorough learning outcomes. Should be presentational skills. Demonstrate substantile learning outcomes. Should some unfamiliar sit Demonstrate general outcomes. Show evide familiar situations. Appl Demonstrate partial bushow evidence of som knowledge to solve prodenostrate little or no of analytical and critical substantial situations.	nave satisfactorily completed at lear decision Analytics/Risk Management/Sinit their applications to the Departmenty for students majoring in Decision 3799, STAT4766 and STAT4799. Allowed to take this capstone course is offer in 2021 - 2022: You mastery at an advanced level of extensive how strong analytical and critical abilities and loo a wide range of complex, familiar and unfarrial command of a broad range of knowledge a ow evidence of analytical and critical abilities and loo a wide range of complex, familiar and unfarrial command of a broad range of knowledge and evidence of some analytical and critical abilities and ly moderately effective organizational and present it limited command of knowledge and skills received the command of knowledge and skills received the command of knowledge and skills received the conservation of th	st 24 cred statistics Ma t. Analytics/F their year their year standard statistics Ma their year the	its of advanced ajors. Students who ajors. Students who ais to be a student with evidence of origins. Apply highly effective for attaining and ability to apply lis. If or attaining most of king, and ability to apps. In a some of the course a critical abilities. Show esentational skills.	level disciplinary or are interested in a serior interested in a serior interested in a serior interested in a serior interested in a serior interested in a serior interest interest in a serior interest interes	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Students core/electaking the This cap mutually The earli Y 1s B C D Fail	s are expected to hetive courses in the Decourse should subnostone course is only exclusive with STAT; est that a student is a set sem. In the properties of the sem	nave satisfactorily completed at lear decision Analytics/Risk Management/Sinit their applications to the Departmenty for students majoring in Decision 3799, STAT4766 and STAT4799. Allowed to take this capstone course is offer in 2021 - 2022: You mastery at an advanced level of extensive how strong analytical and critical abilities and loo a wide range of complex, familiar and unfarrial command of a broad range of knowledge a ow evidence of analytical and critical abilities and loo a wide range of complex, familiar and unfarrial command of a broad range of knowledge and evidence of some analytical and critical abilities and ly moderately effective organizational and present it limited command of knowledge and skills received the command of knowledge and skills received the command of knowledge and skills received the conservation of th	st 24 cred statistics Ma t. Analytics/F their year their year standard statistics Ma their year the	its of advanced ajors. Students who ajors. Students who ais to be a student with evidence of origins. Apply highly effective for attaining at leading, and ability to apply lis. If or attaining most of king, and ability to apply and ability to apply and ability to apply lis. In a some of the course are attaining the course lead or no ability to apply to apply list.	level disciplinary or are interested in a serior interested in a serior interested in a serior interested in a serior interested in a serior interested in a serior interest interest in a serior interest interes	
and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching	Students core/electaking the This cap mutually The earli Y 1s B C D Fail Project-b Activities	s are expected to hetive courses in the Decourse should subnostone course is only exclusive with STAT; est that a student is a set sem. In the properties of the sem	nave satisfactorily completed at lear decision Analytics/Risk Management/Sinit their applications to the Departmen y for students majoring in Decision 3799, STAT4766 and STAT4799. Allowed to take this capstone course is offer in 2021 - 2022: You mastery at an advanced level of extensive how strong analytical and critical abilities and loo a wide range of complex, familiar and unfare the strong analytical and critical abilities are sown evidence of analytical and critical abilities are trustions. Apply effective organizational and present to the strong analytical and critical abilities and long the strong analytical and critical abilities and long the strong analytical and critical abilities and long the strong analytical and critical abilities and ly moderately effective organizational and present to limited command of knowledge and skills recommended to evidence of command of knowledge and skills are decidence of command of knowledge and skills are minimally effective and presentational skills are minimally effective and presentational skills are minimally effective and presentational skills are minimally effective and presentational skills are minimally effective and presentational skills are minimally effective and presentational skills are minimally effective and presentational skills are minimally effective and presentational skills are minimally effective.	st 24 cred statistics Ma t. Analytics/F stheir year anowledge angical thinking, niliar situation and skills required dogical think entational skill entational skill analytical and ational and pre s required for attai analytical and ational and pre s required for owe very little e or ineffective	its of advanced ajors. Students who ajors. Students who ajors. Students who ajors. Students who ajors. Students who ajors. Students with evidence of origins. Apply highly effective for attaining and ability to apply lis. If for attaining most of king, and ability to apply and apply apply and apply and apply app	level disciplinary or are interested in a second of the course of the co	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching & Learning Activities Assessment Methods	Students core/electaking the This cap mutually The earli Y 1s B C D Fail Project-b Activities	s are expected to hetive courses in the Decourse should subnostone course is only exclusive with STAT; est that a student is a set sem. In the set that a student is a set sem. In the sem of the sem	nave satisfactorily completed at lear decision Analytics/Risk Management/Sinit their applications to the Departmen y for students majoring in Decision 3799, STAT4766 and STAT4799. Allowed to take this capstone course is offer in 2021 - 2022: You mastery at an advanced level of extensive how strong analytical and critical abilities and loo a wide range of complex, familiar and unfarrial command of a broad range of knowledge a low evidence of analytical and critical abilities are tutations. Apply effective organizational and presult limited command of knowledge and ence of some analytical and critical abilities and ly moderately effective organizational and presult limited command of knowledge and skills recommended to evidence of command of knowledge and skills recommended to evidence of command of knowledge and skills are with the skills of evidence of command of knowledge and skills are minimally effective organizational skills	st 24 cred statistics Ma t. Analytics/F stheir year statistics Ma t. Analytics/F stheir year statistics/F stheir year statistics/F stheir year statistics/F stheir year statistics/F stat	its of advanced ajors. Students who ajors. Students who ajors. Students who ajors. Students who ajors. Students who ajors. Students with evidence of origins. Apply highly effective for attaining and ability to apply lis. If for attaining most of king, and ability to apply and apply apply and apply and apply app	level disciplinary or are interested in a second of the course of the co	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	Students core/electaking the This cap mutually The earli Y 1s A B C D Fail Project-b Activitie Reading Methods	s are expected to hetive courses in the Decourse should subnostone course is only exclusive with STAT; est that a student is a set sem. In the set that a student is a set sem. In the sem of the sem	nave satisfactorily completed at lear decision Analytics/Risk Management/Sinit their applications to the Departmen y for students majoring in Decision 3799, STAT4766 and STAT4799. Allowed to take this capstone course is offer in 2021 - 2022: You mastery at an advanced level of extensive learning analytical and critical abilities and loo a wide range of complex, familiar and unfare the state of the state o	st 24 cred statistics Ma t. Analytics/F stheir year statistics Ma t. Analytics/F stheir year statistics/F stheir year statistics/F stheir year statistics/F stheir year statistics/F stat	its of advanced ajors. Students who ajors. Students who also students who also students who also students with evidence of origins. Apply highly effective and ability to apply lis. If or attaining most of king, and ability to apply a critical abilities. Show seentational skills. Attaining the course or no ability to apply a critical abilities.	level disciplinary or are interested in a serior interested in a serior interested in a serior interested in a serior interested in a serior interested in a serior interested in a serior interest inter	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching & Learning Activities Assessment Methods	Students core/electaking the This cap mutually The earli Y 1s A B C D Fail Project-b Activitie Reading Methods	s are expected to hetive courses in the Decrease should subnostone course is only exclusive with STAT3 exclusive with a student is a state and some unfamiliar sit sem 2nd sem O Demonstrate thorough learning outcomes. Shoto apply knowledge to presentational skills. Demonstrate substantilearning outcomes. Show enders and some unfamiliar sit Demonstrate general outcomes. Show evidence of som knowledge to solve pro Demonstrate little or no of analytical and critic problems. Organization pased course sets of the state of the	nave satisfactorily completed at lear decision Analytics/Risk Management/Sinit their applications to the Departmenty for students majoring in Decision 3799, STAT4766 and STAT4799. allowed to take this capstone course is lifter in 2021 - 2022: You mastery at an advanced level of extensive learners and analytical and critical abilities and lote a wide range of complex, familiar and unfartial command of a broad range of knowledge a low evidence of analytical and critical abilities and lote a wide range of complex, familiar and unfartial command of a broad range of knowledge and ow evidence of analytical and critical abilities and logen and the complete command of knowledge and sence of some analytical and critical abilities and lymoderately effective organizational and present immitted command of knowledge and skills receive coherent and logical thinking, but with limited ablems. Apply limited or barely effective organizational and present ecoherent and logical thinking, but with limited ablems. Apply limited or barely effective organizational skills reminimally effective presentational skills are minimally effective presentational skills are minimally effective Details Tutorials, group work/project, rear Details oral presentation, progress, attendance, and in-class	st 24 cred statistics Ma t. Analytics/F stheir year statistics Ma t. Analytics/F stheir year statistics/F stheir year statistics/F stheir year statistics/F stheir year statistics/F stat	its of advanced ajors. Students who ajors. Students who ais to be a student with evidence of origins. Apply highly effective for attaining at leaing, and ability to apply lis. If or attaining most of king, and ability to apply and apply lis. If or attaining most of king, and ability to apply lis. In the apply list of a critical abilities. Show esentational skills. It attaining the course leaf or no ability to apply be apply list. It will be apply list. It	level disciplinary or are interested in Statistics, and is No Exam taining all the course lal thought, and ability we organizational and lest most of the course learning ly knowledge to familiar of the course learning outcomes. I limited ability to apply arming outcomes. Lack of knowledge to solve No. of Hours 120 Assessment Methods to CLO Mapping	
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F) Course Type Course Teaching & Learning Activities Assessment Methods	Students core/elect taking the This cap mutually The earli Y 1s A B C D Fail Project-b Activitie Reading Methods Oral pre Researcd No specific taking the taking the taking the taking taking the taking taki	s are expected to hetive courses in the Decourse should subnostone course is only exclusive with STAT est that a student is at sem 2nd sem O Demonstrate thorough learning outcomes. Shoto apply knowledge to presentational skills. Demonstrate substantil learning outcomes. Sho and some unfamiliar sit Demonstrate general outcomes. Show eviden familiar situations. Appl Demonstrate partial bushow evidence of som knowledge to solve pro Demonstrate little or no of analytical and critic problems. Organization problems. Organization problems. Organization assed course sets and the portion of the study set of the study se	nave satisfactorily completed at lear decision Analytics/Risk Management/Sinit their applications to the Departmenty for students majoring in Decision 3799, STAT4766 and STAT4799. Allowed to take this capstone course is lifter in 2021 - 2022: You mastery at an advanced level of extensive how strong analytical and critical abilities and lote a wide range of complex, familiar and unfartial command of a broad range of knowledge a owtendence of analytical and critical abilities and uniformatical and critical abilities and lote a wide range of complex, familiar and unfartial command of a broad range of knowledge and owtendence of analytical and critical abilities and lymoderately effective organizational and present limited command of knowledge and skills rete coherent and logical thinking, but with limited abilities, Apply limited or barely effective organizational considerational skills are minimally effective organizational skills retered and skills and presentational skills are minimally effective. Details Tutorials, group work/project, read the presentation, progress, attendance, and in-class discussion	st 24 cred statistics Ma t. Analytics/F stheir year statistics Ma t. Analytics/F stheir year statistics ma statistics ma statistics ma statistics required d logical think sentational skills required d logical think statistics required at logical think statistics required at logical think statistics required at logical think statistics required at logical think statistics required at logical think statistics required analytical and stream s required for low very little e or ineffective adding/self-s Weig cou ged to obta	its of advanced ajors. Students who ajors. Students who askills required for at with evidence of origins. Apply highly effective for attaining and ability to apply lis. If or attaining most of king, and ability to apply semantial abilities. Show esentational skills. Attaining the course or no ability to apply e. It of the course of the course the course or no ability to apply e. It of the course lead or no ability to apply e. It of the course lead or no ability to apply e. It of the course lead or no ability to apply e. It of the course lead or no ability to apply e. It of the course lead or no ability to apply e. It of the course lead or no ability to apply e. It of the course lead or no ability to apply e. It of the course lead or no ability to apply e. It of the course lead or no ability to apply e. It of the course lead or no ability to apply e. It of the course lead or no ability to apply e. It of the course lead or no ability to apply e.	level disciplinary or are interested in Statistics, and is No Exam taining all the course had thought, and ability we organizational and lest most of the course knowledge to familiar of the course learning ly knowledge to most see learning outcomes. I limited ability to apply arring outcomes. Lack who knowledge to solve No. of Hours 120 Assessment Methods to CLO Mapping CLO 1,2,3,4,5,6 CLO 1,2,3,4,5,6	

STAT4711	Capstone experience for actuarial science undergraduates (6 credits)	Academic Year	2020
Offering Department	Statistics & Actuarial Science	Quota	50
Course Co-ordinator	Prof G Yin, Statistics & Actuarial Science (ug_enquiry@saas.hku.hk)		
Teachers Involved	(Prof G Yin, Statistics & Actuarial Science)		
Course Objectives	This project-based course aims to provide students with capstone experience problems in actuarial science by integrating and applying actuarial theories an years. It aims to help the students to establish a good and solid foundation students to equip with hands-on experience in solving practical problems designing the solution, and presentation of the results.	d techniques learnt of self-learning skil	in their university ls, and to enable
Course Contents	No formal teaching will be given for this course. Students are expected to de	evote 120-140 hour	s working on this

& Topics	supervisor. Semester, al Topics acce as life insura also encour and/or indus relevance to	Students are require nd submit their final ruptable for projects in ptable for projects in aged to suggest top stry supervisor. All to actuarial science.	groups of four or five under the sud to give a presentation on their work eport at the end of the semester. It is course can be related to any of the ce, investment, enterprise risk managics in non-traditional actuarial areas pics for this course will be subject to	k two to three weeks be ne traditional actuarial ar ement and general insu provided they can find final approval by the De	eas of practice such rance. Students are a suitable teacher epartment to ensure
			n the topic for a practical project, or make suggestion on a solution of the		
Course Learning			course, students should be able to:	problem racinalisa in ale	ii project.
Outcomes	CLO 1 defin	· · · · · · · · · · · · · · · · · · ·	em, discuss the issues faced by dif	ferent stakeholders, and	d design workable
	CLO 2 integ	grate theoretical resul	ts and practical approaches, and to s	pecify limitations of curre	nt developments
	CLO 3 work	in a team and to col	laborate with members with different b	oackground	
			ffectively in a written report and in ora	•	
	CLO 5 deve		ritical thinking, creativity, technical rep	oort writing, communication	on and consultation
		ain to a non-actuari ncial security system	al audience the approaches of actu	arial science as applied	I to problems in a
(and Co-requisites and Impermissible combinations)	Pass in STA This capstor STAT4798.	T3909, or already en ne course is only for	AT3901, or already enrolled in this controlled in this course); and BSc(Actuarial Science) students, and wed to take this capstone course is the	d is mutually exclusive v	with STAT4767 and
Offer in 2020 - 2021		em 2nd sem Offer	•	Examination	No Exam
Grade Descriptors (A+ to F)	A E	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.			
	le le	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.			
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.				
	Fail C	knowledge to solve probler Demonstrate little or no evior of analytical and critical a		nal and presentational skills. quired for attaining the course very little or no ability to app	ow limited ability to apply learning outcomes. Lack
Course Type	Fail C	knowledge to solve probler Demonstrate little or no evi of analytical and critical a problems. Organization and	ns. Apply limited or barely effective organization idence of command of knowledge and skills re- abilities, logical and coherent thinking. Show	nal and presentational skills. quired for attaining the course very little or no ability to app	ow limited ability to apply learning outcomes. Lack
Course Type Course Teaching	Fail C	knowledge to solve probler Demonstrate little or no evi of analytical and critical a problems. Organization and	ns. Apply limited or barely effective organization idence of command of knowledge and skills re- abilities, logical and coherent thinking. Show	nal and presentational skills. quired for attaining the course very little or no ability to app	ow limited ability to apply learning outcomes. Lack
	Fail C p	knowledge to solve probler Demonstrate little or no evior of analytical and critical a problems. Organization and ed course	ns. Apply limited or barely effective organization idence of command of knowledge and skills re- ibilities, logical and coherent thinking. Show d presentational skills are minimally effective or	nal and presentational skills. quired for attaining the course very little or no ability to app ineffective.	ow limited ability to apply learning outcomes. Lack oly knowledge to solve
Course Teaching	Fail Control Project-base Activities	knowledge to solve probler Demonstrate little or no evior of analytical and critical a problems. Organization and ed course	ns. Apply limited or barely effective organization idence of command of knowledge and skills re- biblities, logical and coherent thinking. Show d presentational skills are minimally effective or Details	nal and presentational skills. quired for attaining the course very little or no ability to app ineffective.	we limited ability to apply learning outcomes. Lack oly knowledge to solve No. of Hours 120 Assessment Methods
Course Teaching & Learning Activities Assessment Methods	Project-base Activities Reading / S	knowledge to solve probler Demonstrate little or no evior of analytical and critical a problems. Organization and ed course	ns. Apply limited or barely effective organization idence of command of knowledge and skills resibilities, logical and coherent thinking. Show d presentational skills are minimally effective or Details Tutorials, group work/project, reading	nal and presentational skills. quired for attaining the course is very little or no ability to applied ineffective. ng/self-study Weighting in final	we limited ability to apply learning outcomes. Lack oly knowledge to solve No. of Hours 120 Assessment
Course Teaching & Learning Activities Assessment Methods	Fail Project-base Activities Reading / S Methods	cnowledge to solve probler Demonstrate little or no ev of analytical and critical a problems. Organization and ed course self study	ns. Apply limited or barely effective organization idence of command of knowledge and skills revibilities, logical and coherent thinking. Show depresentational skills are minimally effective or increase. Details Tutorials, group work/project, reading increase. Details oral presentation, progress, attendance and in-class	nal and presentational skills. quired for attaining the course is very little or no ability to applied ineffective. ng/self-study Weighting in final course grade (%)	ow limited ability to apply learning outcomes. Lack oly knowledge to solve No. of Hours 120 Assessment Methods to CLO Mapping

STAT4766	Statistics internship (6 credits)	Academic Year	2020			
Offering Department	Statistics & Actuarial Science	Quota				
Course Co-ordinator	Dr C W Kwan, Statistics & Actuarial Science (cwkwan@hku.hk)					
Teachers Involved	(Various teachers as the assessors of oral presentations and written reports, St	atistics & Actuarial	Science)			
Course Objectives	This course is offered to students majoring in Decision Analytics/Risk Management/Statistics who take on a minimum of 160 hours of internship work related to his/her major disciplines. It provides students with first-hand experience in the applications of academic knowledge in a real-life work environment.					
Course Contents & Topics	Upon completion of the internship, each student is required to submit a written his/her internship experience. The report should emphasize important encountered by the student during his/her internship. In many situations, this was that the student has been involved in during his/her internship.	working/education	nal experiences			
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 gain first-hand work experience in an industry related to decision analytics, risk management or statistics					
	CLO 2 apply knowledge in decision analytics, risk management or statistics work place	to solve practical	problems in the			
	CLO 3 understand contexts for specific quantitative skills developed in basic or statistics courses	lecision analytics, r	risk management			
	CLO 4 communicate specialist knowledge in decision analytics, risk management or statistics to non-experts in a work environment					
Pre-requisites (and Co-requisites	Pass in at least 24 credits of advanced level disciplinary core/elective cou Management/Statistics Majors.	rses in the Decision	on Analytics/Risk			
and Impermissible combinations)	This capstone course is only for students majoring in Decision Analytics/F mutually exclusive with STAT4710.	Risk Management/S	Statistics; and is			
	The earliest that a student is allowed to take this capstone course is their year	3 study.				
Offer in 2020 - 2021	Y 1st sem 2nd sem Summer Offer in 2021 - 2022 : Y	Examination	No Exam			
Grade Descriptors	Demonstrates excellent ability in applying knowledge to solve problems i	n the workplace. Den	nonstrates excellent			

(Pass /Pass with distinction /Fail)	Distincti on	effective collaboration a	n and carrying out the work required in the communication with supervisor(s), colline Course Description regarding working he by supervisor(s), etc.	leagues, and clients in the job.	Successfully fulfills the
	Pass	Able to apply knowledge to solve problems in the workplace. Successfully handles and carries out the work required in the job or assigned by supervisor(s). Establishes effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc. Students demonstrating excellent performance in the above would be awarded a grade of "Distinction".			
	Fail	assigned by supervisor(s	y to solve problems in the workplace. Fails y. Fails to establish effective collaboration y satisfy the requirements set out in the Coupervisor(s), etc. y. The workplace in the workplace in the coupervisor(s), etc. y. The workplace in the workplace in the workplace in the workplace in the workplace in the workplace in the workplace in the workplace. y. The workplace is the workplace in the workplace. y. The workplace is the workplace in the workplace. y. The workplace is the workplace in the workplace in the workplace. y. The workplace is the workplace in the workplac	or communication with superviso	or(s), other colleagues, or
Course Type	Internship				
Course Teaching	Activities		Details		No. of Hours
& Learning Activities	Internship v	vork	it is expected that students are to (or equivalent to 4 weeks full-time	160	
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Oral preser	ntation	oral presentation and in-class discussion	40	CLO 1,2,3,4
	Written report		written report	60	CLO 1,2,3,4
Course Website	http://moodl	e.hku.hk			
Additional Course Information	presentation during the in student bas Satisfactory be recorded interested to Enrolment of	n on their internship nternship period (in the ed on the feedback by completion of this cou d on the student's tra b enrol in this course s of this course is not co	nip, each student is required to experience. Supervisors will asse to case of internships outside the up the external supervisor). The external supervisor will be assessing the course will be assessing the contact the Department to obtain the course select after approval has been obtained	ess the students based oniversity, the internal supe Capstone requirement. De ssed on "Pass/Fail" basis btain the approval.	n their performance rvisor will assess the tails of internship will s. Students who are be made through the

STAT4767	Actuaria	al science interns	ship (6 credits)	Academic Ye	ar 2020	
Offering Department	Statistics	& Actuarial Science	. , ,	Quota		
Course Co-ordinator	Dr A G Be	enchimol, Statistics 8	Actuarial Science (benchi@hku.hk)	·	·	
Feachers Involved	(Various t	eachers as the asse	ssors of oral presentations and written	reports, Statistics & Actuari	al Science)	
Course Objectives			uarial science students who take on a mplete this course as a project based		ar internships. Th	
Course Contents & Topics	encounter	his course will include a written report which should emphasize important working/ educational experiences ncountered by the student during his/her internship. In many situations, this would mean a report of the project(s nat the student has been involved in during his/her internship.				
Course Learning	On succe	ssful completion of th	nis course, students should be able to:			
Outcomes	CLO 1	gain practical exper	iences during internship			
	CLO 2	describe basic actua	arial practices learned during the interr	nship		
	CLO 3	explain how actuaria	al theories learned in University can be	applied in practice		
	CLO 4	provide context for s	specific technical skills developed in ba	asic actuarial courses		
Pre-requisites (and Co-requisites and Impermissible combinations)	programm This caps	ne including STAT39 tone course is only f	of advanced level disciplinary core 01; and or BSc(Actuarial Science) students; an illowed to take this capstone course is	nd is mutually exclusive with	•	
Offer in 2020 - 2021	Y 1st	sem 2nd sem O	ffer in 2021 - 2022 : Y	Examination	No Exam	
Grade Descriptors (Pass /Pass with distinction /Fail)	On Demonstrates excellent ability in applying knowledge to solve problems in the workplace. Demonstrates excellent performance in handling and carrying out the work required in the job or assigned by supervisor(s). Establishes highly effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours, with excellent performance in written and oral report, and excellent evaluation by supervisor(s), etc.					
	Pass	Able to apply knowledge to solve problems in the workplace. Successfully handles and carries out the work required in the job or assigned by supervisor(s). Establishes effective collaboration and communication with supervisor(s), colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regarding working hours, written and oral report, and evaluation by supervisor(s), etc. Students demonstrating excellent performance in the above would be awarded a grade of "Distinction".				
	Fail Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required in the job or assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), other colleagues, or clients in the job. Fails to satisfy the requirements set out in the Course Description regarding working hours, written and oral report, or evaluation by supervisor(s), etc.					
Course Type	Internship)				
Course Teaching	Activities	S	Details		No. of Hours	
& Learning Activities	Internship	o work	it is expected that students are to or 120 working days	it is expected that students are to work at least 6 months or 120 working days		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Oral pres	entation	oral presentation and in-class discussion	40	CLO 1,2,3,4	
	Written re	eport	written report	60	CLO 1,2,3,4	
Course Website	http://mod	odle.hku.hk				
Additional Course	Despite n	discussion				

Enrolment of this course is not conducted via the online course selection system and should be made through the relevant Department/School office after approval has been obtained from the course coordinator.

STAT4798	Statistic	cs and actuarial	science project (6 credits)	Academic Ye	ear 2020	
Offering Department	Statistics	& Actuarial Science		Quota	50	
Course Co-ordinator	Prof S M	S Lee, Statistics & A	Actuarial Science (smslee@hku.hk)			
Teachers Involved	(Various	(Various teachers as the assessors of oral presentations and written reports, Statistics & Actuarial Science)				
Course Objectives	Each yea	ar a few projects su	table for Actuarial Science students wi	Il be offered to provide st	udents with practic	
•	experience	ce in approaching a	real problem, in report writing and in ora	al presentation.	·	
Course Contents	These pr	rojects, under the s	upervision of individual staff members	involve the applications	of statistics and/	
& Topics	probabilit	y in a wide range of	problems of practical and/or academic	interests.		
Course Learning	On succe	essful completion of	this course, students should be able to:			
Outcomes	CLO 1	formulate meaningfu	ıl research problems			
	CLO 2	learn and apply adv	anced techniques in probability and/or s	tatistics to solve real life p	roblems	
	CLO 3	summarize and pres	ent research findings in a professional	manner		
Pre-requisites and Co-requisites and Impermissible combinations)	programs Pass or a This caps This cour	Pass in at least 24 credits of advanced level disciplinary core/elective courses in BSc(Actuarial Science) programme including STAT3902 and STAT3907; and Pass or already enrolled in at least one of the following courses: STAT3911, STAT4602, STAT4904; and This capstone course is only for BSc(Actuarial Science) students; and subject to the consent of course coordinator This course is mutually exclusive with STAT4711.				
Offer in 2020 - 2021			allowed to take this capstone course is Offer in 2021 - 2022 : Y	Examination	No Exam	
Grade Descriptors	A 13		n grasp of the subject. Show strong analytical a			
	С	relevant information from sources, showing ability to make meaningful comparisons between different secondary interpretations and to quote/reference aptly. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.				
	D	· · ·				
		Demonstrate evidence	e of little or no grasp of the knowledge and ur	derstanding of the subject. Evi		
	Fail	them. Misuse of data minimally effective or	abilities, logical and coherent thinking. Limited and results and/or unable to draw appropriate	use of secondary sources and	no critical comparison	
	Project-b	them. Misuse of data minimally effective or ased course	abilities, logical and coherent thinking. Limited and results and/or unable to draw appropriate ineffective.	use of secondary sources and	no critical comparison presentational skills a	
Course Teaching		them. Misuse of data minimally effective or ased course	abilities, logical and coherent thinking. Limited and results and/or unable to draw appropriate	use of secondary sources and	no critical comparison	
Course Teaching	Project-b Activitie	them. Misuse of data minimally effective or ased course	abilities, logical and coherent thinking. Limited and results and/or unable to draw appropriate ineffective.	use of secondary sources and	no critical comparison presentational skills a	
Course Teaching Learning Activities Assessment Methods	Project-b Activitie	them. Misuse of data minimally effective or ased course ss / Self study	abilities, logical and coherent thinking. Limited and results and/or unable to draw appropriate ineffective.	use of secondary sources and	no critical comparison presentational skills a No. of Hours 120 Assessment Methods	
Course Teaching Learning Activities Assessment Methods	Project-b Activitie Reading Methods	them. Misuse of data minimally effective or ased course ss / Self study	abilities, logical and coherent thinking. Limited and results and/or unable to draw appropriate ineffective. Details	use of secondary sources and conclusions. Organization and Weighting in final	no critical comparison presentational skills a No. of Hours 120 Assessment	
Course Teaching Learning Activities Assessment Methods	Project-b Activitie Reading Methods	them. Misuse of data minimally effective or assed course so / Self study	abilities, logical and coherent thinking. Limited and results and/or unable to draw appropriate ineffective. Details Details oral presentation & in-class	wee of secondary sources and conclusions. Organization and Weighting in final course grade (%)	no critical comparison presentational skills a No. of Hours 120 Assessment Methods to CLO Mapping	
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Course Website	Project-b Activitie Reading Methods Oral pres	them. Misuse of data minimally effective or assed course so / Self study	abilities, logical and coherent thinking. Limited and results and/or unable to draw appropriate ineffective. Details Details oral presentation & in-class discussion	weighting in final course grade (%)	No. of Hours 120 Assessment Methods to CLO Mapping CLO 1,2,3	

STAT4799	Statistics project (12 credits)	Academic Year	2020			
Offering Department	Statistics & Actuarial Science	Quota	50			
Course Co-ordinator	Prof S M S Lee, Statistics & Actuarial Science (smslee@hku.hk)					
Teachers Involved	(Various teachers as the assessors of oral presentations and written reports	S,Statistics & Actuarial	Science)			
Course Objectives	Each year a few projects suitable for students majoring in Decision Analyti offered to provide students with practical experience in approaching a reapresentation.					
Course Contents & Topics	These projects, under the supervision of individual staff members, involved probability in a wide range of problems of practical and/or academic interest		statistics and/or			
Course Learning	On successful completion of this course, students should be able to:					
Outcomes	CLO 1 gain first-hand experience in solving a research or applied problem in statistics or related areas					
	CLO 2 develop skills in important technical tools, including the use of computer software or programs, for typical statistical research and data analyses					
	CLO 3 write succinct reports on the findings of a research study					
	CLO 4 make concise oral presentation of the findings of a research study					
Pre-requisites (and Co-requisites	Pass in at least 24 credits of advanced level disciplinary core/elective of Management/Statistics Majors including STAT3600; and	courses in the Decision	on Analytics/Risk			
and Impermissible combinations)	Pass or already enrolled in at least one of the following courses: STAT36 and	12, STAT3911, STAT4	1601, STAT4602;			
	Not for students who have already enrolled in STAT3799 in this academic year.					
	This capstone course is only for students majoring in Decision Analytics/R to the consent of course coordinator.	isk Management/Stati	stics; and subject			
	This course is mutually exclusive with STAT4710.					
	The earliest that a student is allowed to take this capstone course is their ye	ear 3 study.				
Offer in 2020 - 2021	Y Year long Offer in 2021 - 2022 : Y	Examination	No Exam			
Grade Descriptors	A Demonstrate thorough grasp of the subject. Show strong analytical and critical	al abilities and logical think	ng, with evidence of			

STAT4901	Risk the	eory II (6 credits)		Academic Yea	ar 2020			
Offering Department	Statistics	& Actuarial Science		Quota				
Course Co-ordinator	TBC, Stat	tistics & Actuarial Scie	nce ()					
Teachers Involved								
Course Objectives			course in risk theory which extends ory, aggregate claims process, and rel	•	d in STAT3906.			
Course Contents & Topics	coefficien Poisson p	Utility theory; discrete ruin model; compound Poisson risk model; ruin probability; reinsurance; adjustment coefficient; Lundbergs inequality; Tijms approximation; non-homogeneous birth process; contagion model; mixed Poisson process; inflation model; IBNR (Incurred But Not Reported) claims; mixed Erlang distributions; stop-loss moments; equilibrium distributions.						
Course Learning	On succe	On successful completion of this course, students should be able to:						
Outcomes	CLO 2 de CLO 3 ca	CLO 1 understand utility theory including some commonly used utility functions, Jensens inequality, ris and utility maximization CLO 2 define discrete and continuous ruin models CLO 3 calculate the adjustment coefficient, Lundbergs inequality and Tijms approximation in ruin theory						
	CLO 4 ur	nderstand the effect of	f reinsurance and change of paramete	rs on ruin probability				
	CLO 6 ur	nderstand mixed Poiss	eneous birth process and its applicatio son process and its applications includ between stop-loss moments and equilil	ing the inflation model and				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	TAT3906						
Offer in 2020 - 2021	N Off	er in 2021 - 2022 : N		Examination				
Grade Descriptors (A+ to F)	A	learning outcomes. Show to apply knowledge to a presentational skills.	nastery at an advanced level of extensive known strong analytical and critical abilities and logic a wide range of complex, familiar and unfamilian	al thinking, with evidence of origan situations. Apply highly effective	ginal thought, and abilit ctive organizational and			
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	С	outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail							
Course Type		ased course						
Course Teaching	Activities	S	Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials				12			
	Reading	/ Self study			100			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mappin			
and Weighting								
and Weighting	Assignme	ents	Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3,4,5,6			

reading and online materials	edition). Kaas R., Goovaerts M., Dhaene J., & Denuit M.: Modern Actuarial Risk Theory (Springer, 2004, 1st edition). Bowers N.L., Gerber H.U., Hickman J.C. & Jones D.A.: Actuarial Mathematics (Society of Actuaries, 1997, 2nd edition). Willmot G.E. & Lin X.S.: Lundberg Approximations for Compound Distributions with Insurance Applications (Springer, 2000, 1st edition).
Course Website	http://moodle.hku.hk

STAT4902	Selected	I topics in actua	arial science (6 credits)	Academic Ye	ar 2020		
Offering Department		& Actuarial Science	` '	Quota			
Course Co-ordinator	Dr J T Y V	Vong, Statistics & A	Actuarial Science (jefftywong@hku.hk)				
Teachers Involved	(Dr J T Y V	Nong,Statistics & A	Actuarial Science)				
Course Objectives		s course is an advanced course in actuarial science which discusses selected topics which potential graduate lents will find useful. It focuses on tools that are in the frontier of actuarial risk management with examples on lications.					
Course Contents & Topics	Enterprise	e contents will be chosen from the following topics: iterprise risk management; Risk identification and taxonomy; Copulas; Extreme value theory; Applications to risl anagement with emphasis in insurance; Other topics as determined by the instructor					
Course Learning	On succes	sful completion of	this course, students should be able to	0:			
Outcomes	CLO 1						
	CLO 2	understand and	d apply copula to model risk depender	nce			
	CLO 3	understand and	d apply extreme value theory				
	CLO 4	explain approa	ches for managing risks				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	ГАТ3906					
Offer in 2020 - 2021	N Offe	er in 2021 - 2022 : `	Υ	Examination			
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-ba	ased course					
Course Teaching	Activities	•	Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials						
	Reading /	Self study			100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	Coursework (assignments, tutorials and class test(s))	25	CLO 1,2,3,4		
	Examinat			75	CLO 1,2,3,4		
Required/recommended reading and online materials	- Actuarial	Theory for Depend	anagement, Sweeting P., (Cambridge dent Risks, Denuit M., Dhaene J., Goo s, Klugman S.A., Panjer H.H., Willmot	ovaerts M., Kaas R., (Wiley, :	2005, 1st edition)		
Course Website	http://moo			, , , , ,	,		

STAT4903	Actuarial techniques for general insurance (6 credits)	Academic Year	2020
Offering Department	Statistics & Actuarial Science	Quota	
Course Co-ordinator	Dr A G Benchimol, Statistics & Actuarial Science (benchi@hku.hk)		
Teachers Involved	(Dr A G Benchimol, Statistics & Actuarial Science)		
Course Objectives	The purpose of this course is to develop knowledge of the basic techniq liabilities for general insurance. Application of the actuarial techniques to be emphasized. The course also provides general knowledge on the general china. Students will acquire the fundamental concept on general insural supporting calculations.	resolve general insurar eral insurance markets in	nce problems will n Hong Kong and
Course Contents & Topics	1. General Insurance Markets in Hong Kong, Taiwan and PRC Introduction of general insurance markets Regulations on general insurance 2. Basic techniques for ratemaking How to read and use manual rate pages Ratemaking related to exposures Ratemaking related to premiums Ratemaking related to loss and loss adjustment expenses Calculate the underwriting expense provisions Pure premium methods Loss ratio methods		

		differential and relativities erations when selecting t				
		iting claim liabilities				
		nd analyze claim develop	oment triangles			
		ng techniques	Ale and a line to the little in a			
		erations when estimating e recoveries and unpaid	claim adjustment expenses			
		e and validation of the es				
			odeling in General Insurance rise Risk Management, etc.			
Course Learning			course, students should be able to:			
Outcomes	CLO 1	understand the feature	and underlying risk of general insu	urance products		
	CLO 2	·	rate for basic general insurance pr			
D	CLO 3		pilities for general insurance produc	cts		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	TA13906				
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20)22 : Y	Examination	Dec	
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.					
	Fail	Demonstrate little or no evid of analytical and critical ab	lence of command of knowledge and skills bilities, logical and coherent thinking. Sho presentational skills are minimally effective	required for attaining the course ow very little or no ability to ap		
Course Type	Lecture-ba	ased course				
Course Teaching	Activities	3	Details		No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials	/ Self study			12 100	
Assessment Methods	Methods	•	Details	Weighting in final	Assessment	
and Weighting	incurous		Setuno	course grade (%)	Methods to CLO Mapping	
	Assignme		Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3	
,	Examinat		One 3-hour written examination	75	CLO 2,3	
reading and	2010		I Claims Using Basic Techniques,			
online materials Course Website		o, and Modilli, C., Basic i odle.hku.hk	Ratemaking, Casualty Actuarial Sc	oloty, i durtii Euitioii, Octo	JUI 2010	
Additional Course Information	Reference Actuarial Procedure American June 1980 Casualty Casualty Feldblum, PCAS LX	es: Standard Board of the A es in Property/Casualty I: Academy of Actuaries O Actuarial Society Comm Insurance Ratemaking, C S., Personal Automobil	american Academy of Actuaries, A nsurance Ratemaking Committee on Risk Classification ittee on Ratemaking Principles, SI Casualty Actuarial Society, May 19 e Premiums: An Asset Share Prici (excluding Secions 7-9)	n, Risk Classification State tatement of Principles Reg 88 ing Approach for Property-	ement of Principles, arding Property and Casualty Insurance,	

STAT4904	Statistical learning for risk modelling (6 credits) Academic Year 2020							
Offering Department	Statistics & Actuarial Science Quota							
Course Co-ordinator	Dr C Wang, Statistics & Actuarial Science (stacw@hku.hk)							
Teachers Involved	(Dr C Wang, Statistics & Actuarial Science)							
Course Objectives	have a firm understanding of the basic statistical modelling and prediction techni	To make sense of the vast and complex data sets that have emerged in insurance and finance, it is essential to have a firm understanding of the basic statistical modelling and prediction techniques. This course introduces some useful predictive analytics techniques, such as principal component analysis, naive Bayes classification, decision tree models, and cluster analysis. The R programming language will be used for actual implementation						
Course Contents & Topics	Basics of statistical learning, cross-validation, linear model selection and regular methods, dimensional reduction methods), generalised linear model, tree-based boosting, random forests), principal component analysis, naive Bayes classificultering, hierarchical clustering)	methods (decision	on trees, bagging,					
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 understand and apply a wide range of predictive analytics techniques for CLO 2 apply the techniques by using the R programming language and interp	et the outputs	ds					
Pre-requisites (and Co-requisites and Impermissible	CLO 3 recognize and compare the characteristics, strengths and weaknesses of different methods Pass in STAT3907 or STAT3600; and Not for students who have passed in STAT3612, or already enrolled in this course; and For BSc(Actuarial Science) students only.							

combinations)							
Offer in 2020 - 2021	Y 2nd	sem Offer in 2021 - 2		Examination	May		
Grade Descriptors (A+ to F)	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					
	В	· ·					
	С	outcomes. Show evidence	ncomplete command of knowledge and skills of some analytical and critical abilities and logi derately effective organizational and presentation	ical thinking, and ability to app			
	D	Show evidence of some col	ted command of knowledge and skills required nerent and logical thinking, but with limited analy s. Apply limited or barely effective organizationa	tical and critical abilities. Show			
	Fail	of analytical and critical al	dence of command of knowledge and skills requibilities, logical and coherent thinking. Show vipresentational skills are minimally effective or in	ery little or no ability to apply			
Course Type	Lecture-ba	sed course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures			36			
	Tutorials			12			
	Reading / Self study				100		
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		Coursework (assignments, class test(s) and computer-based project (s))	50	CLO 1,2,3		
	Examinati	on	One 2-hour written examination	50	CLO 1,2,3		
Required/recommended reading and online materials	An Introdu Springer	ction to Statistical Lear	ning, with Applications in R, James, V	Vitten, Hastie, Tibshirani	, 2013, New York		
Course Website	I- 44 / /	dle.hku.hk					

STAT7609	Researc	h methods in sta	atistics (6 credits)	Academic Year	2020		
Offering Department	Statistics	& Actuarial Science	•	Quota			
Course Co-ordinator	Prof J J F	Yao, Statistics & Ac	tuarial Science (jeffyao@hku.hk)				
Teachers Involved	(Prof J J F	Yao, Statistics & Ac	tuarial Science)				
Course Objectives	preparing technique	This course introduces some statistical concepts and methods which potential graduate students will find useful in preparing for work on a research degree in statistics. Focus is on applications of state-of-the-art statistical echniques and their underlying theory.					
Course Contents & Topics	(1) Basic theorems; (2) Param signed like (3) Nonpronparam (4) Compu (5) Robus (6) U-stati	Contents may be selected from: (1) Basic asymptotic methods: modes of convergence; stochastic orders; laws of large numbers; central limit theorems; delta method; Edgeworth expansions; saddlepoint approximations. (2) Parametric and nonparametric likelihood methods: high-order approximations; profile likelihood and its variants; signed likelihood ratio statistics; empirical likelihood. (3) Nonparametric statistical inference: sample quantiles; sign and rank tests; Kolmogorov-Smirnov test; nonparametric regression; density estimation; kernel methods. (4) Computationally-intensive methods: cross-validation; bootstrap; permutation methods. (5) Robust methods: measures of robustness; M-estimator; L-estimator; R-estimator; estimating functions. (6) U-statistics, projection methods. (7) Other topics as determined by the instructor.					
Course Learning	On succes	ssful completion of th	nis course, students should be able	to:			
Outcomes	CLO 1	comprehend the lang	guage and technicalities found in st	atistical research literature			
	CLO 2 understand the use of standard mathematical tools for conducting statistical research						
	CLO 3 apply a variety of research tools to solve standard statistical problems						
	CLO 4 acquire exposure to some developments in contemporary statistical research						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	TAT3600 or STAT39	907				
Offer in 2020 - 2021	Y 1st	sem Offer in 2021	- 2022 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	В	learning outcomes. Sho to apply knowledge to presentational skills. Demonstrate substantia	mastery at an advanced level of extensivow strong analytical and critical abilities and a wide range of complex, familiar and ural command of a broad range of knowledg	I logical thinking, with evidence of original familiar situations. Apply highly effective and skills required for attaining at leas	al thought, and ability e organizational and st most of the course		
	learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.						
	Fail	of analytical and critic	o evidence of command of knowledge and s al abilities, logical and coherent thinking. a and presentational skills are minimally effe	Show very little or no ability to apply			
Course Type	Lecture-ba	ased course	·				
Course Teaching	Activities	B	Details		No. of Hours		
Learning Activities	Lectures				36		
& Learning Activities							
	Tutorials				12		

Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments	Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3,4
	Examination	One 2-hour written examination	75	CLO 1,2,3,4
Required/recommended reading and online materials	Owen, A.B. (2001). Empirical Likel Shao, J. (1999). Mathematical Sta	 An Introduction to the Bootstrap. hood. Chapman & Hall: Boca Rator tistics. Springer: New York. cambridge: Cambridge Univer 	n.	ork.
Course Website	http://moodle.hku.hk			

	Advance	ed probability (6 cre	edits)	Academic Year	2020		
Offering Department	Statistics 8	& Actuarial Science		Quota			
Course Co-ordinator	Prof H L Y	ang, Statistics & Actuar	rial Science (hlyang@hku.hk)				
Teachers Involved	(Prof H L \	Yang,Statistics & Actuar	rial Science)				
Course Objectives	concepts i	his course provides an introduction to measure theory and probability. The course will focus on some basic encepts in theoretical probability which are important for students to do research in actuarial science, probability and statistics.					
Course Contents & Topics	space, m	ontents include: sigma-algebra, measurable space, measure and probability, measure space and probability pace, measurable functions, random variables, integration theory, characteristic functions, convergence of andom variables, Hilbert spaces, conditional expectation, martingales.					
Course Learning	On succes	sful completion of this	course, students should be able to:				
Outcomes	CLO 2 lea	derstand the fundamen arn the general concept d dominated converger	neory otone convergence theorer	m, Fatou's lemma			
	CLO 3 un	derstand the concept of	f conditional expectation				
	CLO 4 ha	ve some elementary kn	owledge of martingale				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	TAT3603 or STAT3903					
Offer in 2020 - 2021	Y 1st	sem Offer in 2021 - 20	022 : Y	Examination	Dec		
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.						
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	familiar situations. Apply mo Demonstrate partial but lim Show evidence of some col knowledge to solve problem	oderately effective organizational and present ited command of knowledge and skills requi herent and logical thinking, but with limited an is. Apply limited or barely effective organizati	ational skills. red for attaining some of the cour nalytical and critical abilities. Show onal and presentational skills.	oly knowledge to most se learning outcomes. Inimited ability to apply		
		familiar situations. Apply mo Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evio of analytical and critical a	oderately effective organizational and present ited command of knowledge and skills requi herent and logical thinking, but with limited ar	national skills. red for attaining some of the cour- nalytical and critical abilities. Show- onal and presentational skills. equired for attaining the course lea- v very little or no ability to apply	se learning outcomes. Ilmited ability to apply		
	D Fail	familiar situations. Apply mo Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evio of analytical and critical a problems. Organization and ased course	oderately effective organizational and present lited command of knowledge and skills requinerent and logical thinking, but with limited and is. Apply limited or barely effective organization dence of command of knowledge and skills rebilities, logical and coherent thinking. Show presentational skills are minimally effective of the contraction of the con	national skills. red for attaining some of the cour- nalytical and critical abilities. Show- onal and presentational skills. equired for attaining the course lea- v very little or no ability to apply	oly knowledge to most se learning outcomes. I limited ability to apply arning outcomes. Lack / knowledge to solve		
Course Teaching	D Fail	familiar situations. Apply mo Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evio of analytical and critical a problems. Organization and ased course	oderately effective organizational and present ited command of knowledge and skills requi herent and logical thinking, but with limited an is. Apply limited or barely effective organizati dence of command of knowledge and skills r bilities, logical and coherent thinking. Show	national skills. red for attaining some of the cour- nalytical and critical abilities. Show- onal and presentational skills. equired for attaining the course lea- v very little or no ability to apply	se learning outcomes. Ilmited ability to apply		
Course Teaching	D Fail	familiar situations. Apply mo Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evio of analytical and critical a problems. Organization and ased course	oderately effective organizational and present lited command of knowledge and skills requinerent and logical thinking, but with limited and is. Apply limited or barely effective organization dence of command of knowledge and skills rebilities, logical and coherent thinking. Show presentational skills are minimally effective of the contraction of the con	national skills. red for attaining some of the cour- nalytical and critical abilities. Show- onal and presentational skills. equired for attaining the course lea- v very little or no ability to apply	lly knowledge to most se learning outcomes. Ilimited ability to apply arming outcomes. Lack / knowledge to solve		
Course Teaching	D Fail Lecture-ba Activities	familiar situations. Apply mo Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evio of analytical and critical a problems. Organization and ased course	oderately effective organizational and present lited command of knowledge and skills requinerent and logical thinking, but with limited and is. Apply limited or barely effective organization dence of command of knowledge and skills rebilities, logical and coherent thinking. Show presentational skills are minimally effective of the contraction of the con	national skills. red for attaining some of the cour- nalytical and critical abilities. Show- onal and presentational skills. equired for attaining the course lea- v very little or no ability to apply	lly knowledge to most se learning outcomes. Ilimited ability to apply arming outcomes. Lack / knowledge to solve No. of Hours 36 12		
Course Teaching	D Fail Lecture-ba Activities Lectures Tutorials	familiar situations. Apply mo Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evio of analytical and critical a problems. Organization and ased course	oderately effective organizational and present lited command of knowledge and skills requinerent and logical thinking, but with limited and is. Apply limited or barely effective organization dence of command of knowledge and skills rebilities, logical and coherent thinking. Show presentational skills are minimally effective of the contraction of the con	national skills. red for attaining some of the cour- nalytical and critical abilities. Show- onal and presentational skills. equired for attaining the course lea- v very little or no ability to apply	lly knowledge to most se learning outcomes. Ilimited ability to apply arming outcomes. Lack / knowledge to solve		
Course Teaching & Learning Activities Assessment Methods	D Fail Lecture-ba Activities Lectures Tutorials	familiar situations. Apply mo Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evi of analytical and critical a problems. Organization and used course	oderately effective organizational and present lited command of knowledge and skills requinerent and logical thinking, but with limited and is. Apply limited or barely effective organization dence of command of knowledge and skills rebilities, logical and coherent thinking. Show presentational skills are minimally effective of the contraction of the con	ational skills. red for attaining some of the cournalytical and critical abilities. Show onal and presentational skills. equired for attaining the course leavery little or no ability to apply or ineffective. Weighting in final course grade (%)	lly knowledge to most se learning outcomes. Ilimited ability to apply arming outcomes. Lack / knowledge to solve No. of Hours 36 12		
Course Teaching & Learning Activities Assessment Methods	D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme	familiar situations. Apply mo Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evid of analytical and critical al problems. Organization and ased course	derately effective organizational and present lited command of knowledge and skills requinerent and logical thinking, but with limited and its. Apply limited or barely effective organization dence of command of knowledge and skills rebilities, logical and coherent thinking. Show presentational skills are minimally effective of the command of the com	ational skills. red for attaining some of the cour- nalytical and critical abilities. Show onal and presentational skills. equired for attaining the course lea v very little or no ability to apply or ineffective. Weighting in final course grade (%)	se learning outcomes. I limited ability to apply arning outcomes. Lacky knowledge to solve No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4		
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods	familiar situations. Apply mo Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evid of analytical and critical al problems. Organization and ased course	derately effective organizational and present lited command of knowledge and skills requinerent and logical thinking, but with limited and is. Apply limited or barely effective organization dence of command of knowledge and skills relibilities, logical and coherent thinking. Show presentational skills are minimally effective of the command of the co	ational skills. red for attaining some of the cournalytical and critical abilities. Show onal and presentational skills. equired for attaining the course leaver of the cournal skills or ineffective. Weighting in final course grade (%)	se learning outcomes. limited ability to apply arming outcomes. Lack / knowledge to solve No. of Hours 36 12 100 Assessment Methods to CLO Mapping		
Course Teaching & Learning Activities Assessment Methods	D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati Jean Jaco New York,	familiar situations. Apply mo Demonstrate partial but lim Show evidence of some col knowledge to solve problem Demonstrate little or no evidence and critical and critical and problems. Organization and ased course Self study The	derately effective organizational and present lited command of knowledge and skills requinerent and logical thinking, but with limited and its. Apply limited or barely effective organization dence of command of knowledge and skills rebilities, logical and coherent thinking. Show presentational skills are minimally effective of the command of the com	ational skills. red for attaining some of the cour- nalytical and critical abilities. Show onal and presentational skills. equired for attaining the course lea v very little or no ability to apply or ineffective. Weighting in final course grade (%) 25 75 ringer-Verlag,	se learning outcomes. I limited ability to apply arning outcomes. Lacky knowledge to solve No. of Hours 36 12 100 Assessment Methods to CLO Mapping CLO 1,2,3,4		

STAT7611	Computational statistics (6 credits) Academic Year 202						
Offering Department	Statistics & Actuarial Science	Quota					
Course Co-ordinator	Prof G Yin, Statistics & Actuarial Science (gyin@hku.hk)						
Teachers Involved	(Prof G Yin, Statistics & Actuarial Science)						
Course Objectives	This course aims to give undergraduate and postgraduate students in statistics a background in modern computationally intensive methods in statistics. It emphasizes the role of computation as a fundamental tool of discovery in data analysis, of statistical inference, and for development of statistical theory and methods.						
Course Contents & Topics	Contents include: Bayesian statistics, Markov chain Monte Carlo methods in Hastings algorithm, and data augmentation; Generation of random varial rejection sampling, the sampling/importance resampling method; Optimiz method, expectation-maximization (EM) algorithm and its variants, and mino Integration including Laplace approximations, Gaussian quadrature, the im topics such as Hidden Markov models, neural networks, and Bootstrap meth	les including the invaliding the invaliding techniques including the invaliding t	version methods, luding Newton' s (MM) algorithms;				
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1 understand the importance of the technique for generating random variables in Bayesian statistics, Mon Carlo integration and bootstrapping methods						

CLC	O 3 understand the essence a their range of application, O 4 apply EM-type algorithms generate posterior sample O 5 apply Bootstrap methods parameters for both parameters in STAT3600 or STAT3907 1st sem Offer in 2021 - 20 Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a wipresentational skills. Demonstrate substantial coil	to obtain estimated standard errors netric and non-parametric cases	blems ply Markov chain Monte s of estimators and conf Examination wledge and skills required for all thinking, with evidence of original thinking, with evidence of original thinking, with evidence of original thinking.	e Carlo methods to fidence intervals of Dec attaining all the course		
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	O 4 apply EM-type algorithms generate posterior sample O 5 apply Bootstrap methods parameters for both parameters in STAT3600 or STAT3907 1st sem Offer in 2021 - 20 Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a wipresentational skills. Demonstrate substantial coil	to find the posterior mode and appears to obtain estimated standard errors netric and non-parametric cases 222: Y tery at an advanced level of extensive know trong analytical and critical abilities and logice	ply Markov chain Monte s of estimators and conf Examination wedge and skills required for all thinking, with evidence of original properties.	Dec attaining all the course		
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	parameters for both parameters in STAT3600 or STAT3907 1st sem Offer in 2021 - 20 Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a wighter presentational skills. Demonstrate substantial co	netric and non-parametric cases 222: Y tery at an advanced level of extensive know trong analytical and critical abilities and logice	Examination Wedge and skills required for all thinking, with evidence of originals.	Dec attaining all the course		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)	1st sem Offer in 2021 - 20 Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a wipresentational skills. Demonstrate substantial core	tery at an advanced level of extensive know trong analytical and critical abilities and logical	wledge and skills required for all thinking, with evidence of orig	attaining all the course		
Grade Descriptors (A+ to F)	Demonstrate thorough mas learning outcomes. Show st to apply knowledge to a wi presentational skills. Demonstrate substantial co	tery at an advanced level of extensive know trong analytical and critical abilities and logical	wledge and skills required for all thinking, with evidence of orig	attaining all the course		
(A+ to F)	learning outcomes. Show st to apply knowledge to a wi presentational skills. Demonstrate substantial columns	trong analytical and critical abilities and logica	al thinking, with evidence of original			
В			ir situations. Apply nignly effec			
	and some unfamiliar situatio	skills required for attaining at longical thinking, and ability to applational skills.				
С	outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to months familiar situations. Apply moderately effective organizational and presentational skills.					
D	Show evidence of some con knowledge to solve problem	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcome. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to approximate the solve problems. Apply limited or barely effective organizational and presentational skills.				
Fail	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
Course Type Lect	ture-based course					
	tivities	Details	No. of Hours			
& Learning Activities Lec	ctures			36		
Tuto	torials			12		
Rea	ading / Self study			100		
Assessment Methods and Weighting	thods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
Ass	signments	Coursework (assignments, practical work, and a term test)	50	CLO 1,2,3,4,5		
Exa	amination	One 2-hour written examination 50 CLO 1,2,3,4,5				
reading and Comonline materials Give						
	o://moodle.hku.hk	cano canonical monicae (Opinige	, 2000, End Odition)			

STAT7614	Advanc	ed statist	cal modell	ing (6 credits)			Academic Year	2020		
Offering Department	Statistics	& Actuarial	Science				Quota			
Course Co-ordinator	Dr Y K Chung, Statistics & Actuarial Science (yukchung@hku.hk)									
Teachers Involved	(Dr Y K Chung, Statistics & Actuarial Science)									
Course Objectives	This course introduces modern methods for constructing and evaluating statistical models and their implementation									
•	using popular computing software, such as R or Python. It will cover both the underlying principles of eac modelling approach and the model estimation procedures.									
Course Contents & Topics	Topics from: (i) Generalized linear models; (ii) Mixed models; (iii) Kernel and local polynomial regression; selection of smoothing parameters; (iv) Generalized additive models; (v) Hidden Markov model and Bayesian network.									
Course Learning	On succe	essful comple	tion of this co	ourse, students sh	ould be able to:					
Dutcomes	CLO 1 u	nderstand th	e basic chara	acteristic and ratio	nale behind the f	formulation o	f each statistical	model		
	CLO 2 ic	dentify for a	iven set of d	ata the most suital	ole statistical mo	del and tools	to use			
	CLO 3 d	evelop com	utational skil	Is of building scor	ing models for v	arious mana	gement and pred	diction, problen		
				responses; emplo						
	for real data mining problems; and analysing data with R packages glm2, lme4, gam, depmixS4, bnlearr or equivalent Python libraries									
Due ve avrieite e			•							
Pre-requisites	Pass in S	1 A 1 3600 OI	STA13907	Pass in STAT3600 or STAT3907						
and Impermissible										
and Impermissible										
and Impermissible combinations)	Y 1si	t sem 2nd	sem Offer i	n 2021 - 2022 : Y			Examination	Dec May		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	Y 1si	Demonstrate learning out	thorough mast	ery at an advanced le ong analytical and crit	ical abilities and logi	owledge and s	kills required for atta h evidence of origina	aining all the cour al thought, and abi		
(and Co-requisites and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors (A+ to F)		Demonstrate learning out to apply known	thorough mast comes. Show str wledge to a wi	ery at an advanced le	ical abilities and logi	owledge and s	kills required for atta h evidence of origina	aining all the cour al thought, and abi		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A	Demonstrate learning out to apply know presentation	thorough mast comes. Show str wledge to a wid al skills.	ery at an advanced le rong analytical and crit de range of complex,	ical abilities and logi familiar and unfami	owledge and s cal thinking, wit liar situations.	kills required for atta h evidence of origina Apply highly effective	aining all the cour al thought, and abi e organizational a		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors		Demonstrate learning out to apply kne presentation Demonstrate learning out	thorough mast comes. Show str wledge to a wid al skills. substantial con- comes. Show evi	ery at an advanced le rong analytical and crit de range of complex, nmand of a broad ran idence of analytical an	ical abilities and logi familiar and unfami ge of knowledge and d critical abilities and	owledge and s cal thinking, wit liar situationsd d skills required logical thinking	kills required for atta h evidence of origina Apply highly effective I for attaining at leas	aining all the cour al thought, and abi e organizational a		
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and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A	Demonstrate learning out to apply kne presentation Demonstrate learning out and some u Demonstrate	thorough mast comes. Show str wledge to a win al skills. substantial cor- comes. Show evi familiar situation general but in	ery at an advanced li ong analytical and crit de range of complex, nmand of a broad ran dence of analytical and s. Apply effective orga complete command of	ical abilities and logi familiar and unfami ge of knowledge and d critical abilities and inizational and prese f knowledge and sl	owledge and s cal thinking, wit liar situations d skills required logical thinking entational skills. kills required for	kills required for attach evidence of origina Apply highly effectival for attaining at least, and ability to apply or attaining most of	aining all the cour al thought, and abi e organizational a st most of the cour knowledge to fami the course learni		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	В	Demonstrati learning out to apply kni presentation Demonstrati learning out and some u Demonstrati outcomes. S	thorough mast comes. Show str wledge to a wid al skills. substantial cor comes. Show evi familiar situation general but in how evidence of	ery at an advanced li- ong analytical and crit de range of complex, nmand of a broad ran dence of analytical and s. Apply effective orge complete command of some analytical and	ical abilities and logi familiar and unfami ge of knowledge and d critical abilities and inizational and prese if knowledge and si critical abilities and	owledge and s cal thinking, wit liar situations d skills required logical thinking entational skills. kills required for logical thinking	kills required for attach evidence of origina Apply highly effectival for attaining at least, and ability to apply or attaining most of	aining all the cour al thought, and abi e organizational a st most of the cour knowledge to fami the course learni		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A B C	Demonstrate learning out to apply know presentation Demonstrate learning out and some under the properties of the proper	thorough mast comes. Show str wledge to a wire all skills. substantial cor comes. Show evi familiar situation general but in how evidence cotions. Apply mod	ery at an advanced li- rong analytical and crit de range of complex, nmand of a broad ran idence of analytical an- is. Apply effective orga- complete command of f some analytical and derately effective orga-	ical abilities and logi familiar and unfami ge of knowledge and d critical abilities and inizational and prese if knowledge and sl critical abilities and izational and presen	owledge and s cal thinking, wit liar situations d skills required logical thinking intational skills. kills required for logical thinking tational skills.	kills required for attach evidence of origina Apply highly effective of original attachment of the control of t	aining all the cour al thought, and abi e organizational a at most of the cour knowledge to fami the course learni y knowledge to mo		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	В	Demonstrate learning out to apply knu presentation Demonstrate learning out and some u Demonstrate outcomes. Sfamiliar situs Demonstrate	thorough mast comes. Show strewledge to a wire all skills. substantial corromes. Show evifamiliar situation general but in how evidence cotions. Apply more partial but limit	ery at an advanced li- ong analytical and crit de range of complex, nmand of a broad ran dence of analytical an- ss. Apply effective orga complete command of f some analytical and derately effective orgar ed command of knowl	ical abilities and logi familiar and unfami ge of knowledge and d critical abilities and mizational and prese f knowledge and si critical abilities and iziational and presen edge and skills requ	owledge and s cal thinking, wit liar situations. d skills required logical thinking entational skills. kills required for logical thinking tational skills. ired for attainin	kills required for atta h evidence of origina Apply highly effectivation. I for attaining at least, and ability to apply or attaining most of the apply of a some of the course	aining all the cour al thought, and abi e organizational a at most of the cour knowledge to fami the course learni y knowledge to mo e learning outcome		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A B C	Demonstrate learning out to apply known presentation Demonstrate learning out and some under the province outcomes. Signification of the province of the province of the province outcomes are the province outcomes. Significant province outcomes are the province outcomes are the province outcomes are the province outcomes. Significant province outcomes are the province outcomes are	thorough mast comes. Show str wledge to a wire al skills. substantial coromes. Show evifamiliar situation general but inhow evidence cotions. Apply mod partial but limit ce of some coh-	ery at an advanced li- rong analytical and crit de range of complex, nmand of a broad ran dence of analytical annas. Apply effective orga complete command of f some analytical and derately effective orgar ed command of knowl erent and logical thinki	ical abilities and logi familiar and unfami ge of knowledge and d critical abilities and unizational and prese if knowledge and si critical abilities and izational and presen edge and skills requ ng, but with limited a	owledge and s cal thinking, wit liar situations d skills required logical thinking entational skills. kills required for logical thinking stational skills. irred for attainin inalytical and cr	kills required for atta h evidence of origina Apply highly effective for attaining at leas, and ability to apply or attaining most of h, and ability to apply g some of the course titical abilities. Show I	aining all the cour al thought, and abi e organizational a at most of the cour knowledge to fami the course learni y knowledge to mo e learning outcome		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	B C	Demonstrati learning out to apply knipresentation Demonstrati learning out and some u Demonstrati outcomes. § familiar situs Demonstrati Show evided knowledge t	thorough mast comes. Show str wledge to a wire al skills. substantial coromes. Show evifamiliar situation general but in how evidence cotions. Apply more partial but limit ce of some cohes solve problems	ery at an advanced li- ong analytical and crit de range of complex, nmand of a broad ran dence of analytical an- ss. Apply effective orga complete command of f some analytical and derately effective orgar ed command of knowl	ical abilities and logi familiar and unfami ge of knowledge and d critical abilities and inizational and prese f knowledge and sl critical abilities and izational and presen edge and skills requ ing, but with limited y effective organizat y effective organizat	owledge and s cal thinking, wit liar situations d skills required logical thinking intational skills. kills required fo logical thinking tational skills. ired for attainin malytical and cr ional and prese	kills required for attach evidence of origina Apply highly effective for attaining at least, and ability to apply or attaining most of the apply g some of the coursitical abilities. Show Intational skills.	aining all the cour al thought, and abi e organizational a at most of the cour knowledge to fami the course learni y knowledge to me e learning outcom- imited ability to ap		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A B C	Demonstratilearning out to apply kin presentatior Demonstratilearning out and some u Demonstratioutcomes. § familiar situs Demonstration Show evidel knowledge t Demonstrations of the state of the stat	thorough mast somes. Show str wledge to a wire a skills. Substantial coromes. Show edifamiliar situation general but inhow evidence coromet in the strength of	ery at an advanced li- ong analytical and crit de range of complex, nmand of a broad ran idence of analytical and s. Apply effective orge complete command of some analytical and derately effective orgar ed command of knowl erent and logical thinki s. Apply limited or bare	ical abilities and logi familiar and unfami ge of knowledge and critical abilities and inizational and prese of knowledge and si critical abilities and iziational and presen edge and skills requeng, but with limited ally effective organizat nowledge and skills round and present of the critical abilities and iziational and present edge and skills requeng, but with limited ally offective organizationowledge and skills	owledge and s cal thinking, will liar situations d skills required logical thinking intational skills. kills required fo logical thinking tational skills. iired for attainin nalytical and cr ional and prese required for atte	kills required for atta h evidence of origina Apply highly effective of or attaining at least, and ability to apply or attaining most of the apply of attaining most of the course titical abilities. Show Intational skills.	aining all the cour al thought, and abi e organizational a at most of the cour knowledge to fami the course learni y knowledge to mo e learning outcom- imited ability to ap		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	B C	Demonstratilearning out to apply kin presentatior Demonstratilearning out and some u Demonstratioutcomes. Stamiliar situe Demonstratishow evideiknowledge to Demonstratiof analytical of analytical states.	thorough mast somes. Show str wledge to a wire al skills. substantial coromes. Show evifamiliar situation general but inhow evidence of tions. Apply moc partial but limit ce of some coho solve problems little or no evidend and critical ab	ery at an advanced living analytical and critide range of complex, inmand of a broad ran dence of analytical ans. Apply effective orgaterately effective orgated command of knowlerent and logical thinkis. Apply limited or bare ence of command of knowlerent and logical thinkis.	ical abilities and logi familiar and unfami ge of knowledge and dirtical abilities and unizational and prese of knowledge and si critical abilities and izational and presen edge and skills requeng, but with limited a y effective organizat nowledge and skills requency and skills requency and skills requency and skills regulated the constant of the c	owledge and s cal thinking, with liar situations d skills required logical thinking intational skills. kills required fo logical thinking tational skills. irred for attainin analytical and crional and prese required for atta w very little or	kills required for atta h evidence of origina Apply highly effective of or attaining at least, and ability to apply or attaining most of the analysis of the course g some of the course titical abilities. Show I intational skills.	aining all the cour al thought, and abi e organizational a at most of the cour knowledge to fami the course learni y knowledge to mo e learning outcom- imited ability to ap		
and Impermissible combinations) Offer in 2020 - 2021 Grade Descriptors	A B C D	Demonstratilearning out to apply kin presentatior Demonstratilearning out and some u Demonstratioutcomes. Stamiliar situe Demonstratishow evideiknowledge to Demonstratiof analytical of analytical states.	thorough mast comes. Show str wledge to a wire al skills. substantial coromes. Show evifamiliar situation general but inhow evidence of tions. Apply more partial but limit ce of some coho solve problems little or no evidend critical ab ganization and	ery at an advanced lifting analytical and critide range of complex, in mand of a broad randence of analytical annas. Apply effective orga complete command of some analytical and derately effective orgar ed command of knowlerent and logical thinkis. Apply limited or bare ence of command of k	ical abilities and logi familiar and unfami ge of knowledge and dirtical abilities and unizational and prese of knowledge and si critical abilities and izational and presen edge and skills requeng, but with limited a y effective organizat nowledge and skills requency and skills requency and skills requency and skills regulated the constant of the c	owledge and s cal thinking, with liar situations d skills required logical thinking intational skills. kills required fo logical thinking tational skills. irred for attainin analytical and crional and prese required for atta w very little or	kills required for atta h evidence of origina Apply highly effective of or attaining at least, and ability to apply or attaining most of the analysis of the course g some of the course titical abilities. Show I intational skills.	aining all the cour al thought, and abi e organizational a at most of the cour knowledge to fami the course learni y knowledge to mo e learning outcom- imited ability to ap		

& Learning Activities	Lectures			24				
	Tutorials			12				
	Reading / Self study		100					
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping				
	Assignments	Coursework (assignments and class test(s))	50	CLO 1,2,3				
	Examination	One 2-hour written examination	50	CLO 1,2,3				
Required/recommended	R.H. Myers et al., 2010: Generaliz	ed Linear Models (2nd ed.), Wiley						
reading and	W. Hardle et al., 2004: Nonparam	W. Hardle et al., 2004: Nonparametric and Semi-parametric Models. Springer						
online materials	W. Zucchini & I.L. MacDonald, 2009: Hidden Markov Models for Time Series: An Introduction Using R, CRC Press							
	M. Scutari & J. Denis, 2015: Baye	sian Networks: with Examples in R,	CRC Press	-				
Course Website	http://moodle.hku.hk							

STAT7615	Advanced quantitative risk management and finance (6 credits)							
Offering Department		& Actuarial Science		Quota				
Course Co-ordinator			al Science (zhangz08@hku.hk)	14				
Teachers Involved	(Dr Z Zhang, Statistics & Actuarial Science)							
Course Objectives	This course covers statistical methods and models of importance to risk management and finance and links finance theory to market practice via statistical modeling and decision making. Emphases will be put on empirical analyse to address the discrepancy between finance theory and market data.							
Course Contents & Topics	Contents include: Elementary Stochastic Calculus; Basic Monte Carlo and Quasi-Monte Carlo Methods; Varianc Reduction Techniques; Simulating the value of options and the value-at-risk for risk management; Review o univariate volatility models; multivariate volatility models; Value-at-risk and expected shortfall; estimation, bac testing and stress testing; Extreme value theory for risk management.							
Course Learning	On successful completion of this course, students should be able to:							
Outcomes	CLO 1	apply Monte Carlo met	thods to determine the value of options	and other derivative secu	rities			
	CLO 2	predict volatility of a se	et of securities using appropriate model	s				
	CLO 3	estimate the value-at-r	isk under extreme value theory					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	STAT4608						
Offer in 2020 - 2021	Y 2nd	d sem Offer in 2021	- 2022 : Y	Examination	May			
Grade Descriptors (A+ to F)	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.							
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.							
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.							
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills.							
			Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					
	Fail	Demonstrate little or no e of analytical and critical	evidence of command of knowledge and skills re abilities, logical and coherent thinking. Show	equired for attaining the course le very little or no ability to app	earning outcomes. Lack			
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Course Teaching		Demonstrate little or no e of analytical and critical problems. Organization a pased course	evidence of command of knowledge and skills re abilities, logical and coherent thinking. Show	equired for attaining the course le very little or no ability to app	earning outcomes. Lack			
Course Teaching	Lecture-b	Demonstrate little or no e of analytical and critical problems. Organization a passed course	evidence of command of knowledge and skills re abilities, logical and coherent thinking. Show and presentational skills are minimally effective or	equired for attaining the course le very little or no ability to app	varning outcomes. Lack y knowledge to solve			
Course Teaching	Lecture-b Activities Lectures Tutorials	Demonstrate little or no e of analytical and critical problems. Organization a passed course	evidence of command of knowledge and skills re abilities, logical and coherent thinking. Show and presentational skills are minimally effective or	equired for attaining the course le very little or no ability to app	earning outcomes. Lack y knowledge to solve No. of Hours 36 12			
Course Teaching	Lecture-b Activities Lectures Tutorials	Demonstrate little or no e of analytical and critical problems. Organization a passed course	evidence of command of knowledge and skills re abilities, logical and coherent thinking. Show and presentational skills are minimally effective or	equired for attaining the course le very little or no ability to app	varning outcomes. Lack y knowledge to solve No. of Hours 36			
Course Teaching & Learning Activities Assessment Methods	Lecture-b Activities Lectures Tutorials	Demonstrate little or no e of analytical and critical problems. Organization a passed course	evidence of command of knowledge and skills re abilities, logical and coherent thinking. Show and presentational skills are minimally effective or	equired for attaining the course le very little or no ability to app	No. of Hours 36 12			
Course Teaching & Learning Activities Assessment Methods	Lecture-b Activities Lectures Tutorials Reading	Demonstrate little or no e of analytical and critical problems. Organization a passed course	evidence of command of knowledge and skills re abilities, logical and coherent thinking. Show and presentational skills are minimally effective of Details	equired for attaining the course levery little or no ability to applir ineffective. Weighting in final	No. of Hours 36 12 100 Assessment Methods			
Course Teaching & Learning Activities Assessment Methods	Lecture-b Activities Lectures Tutorials Reading Methods	Demonstrate little or no e of analytical and critical problems. Organization a passed course es	evidence of command of knowledge and skills re abilities, logical and coherent thinking. Show and presentational skills are minimally effective of the common of the commo	weighting in final course grade (%)	No. of Hours 36 12 100 Assessment Methods to CLO Mapping			
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Lecture-b Activities Lectures Tutorials Reading Methods Assignme Examinat McLeish, Glasserm Danielsso McNeil, A	Demonstrate little or no e of analytical and critical problems. Organization a passed course as a second of the course as	evidence of command of knowledge and skills re abilities, logical and coherent thinking. Show and presentational skills are minimally effective of the command of the comma	weighting in final course grade (%) Weighting in final course grade (%) 25 75 pringer, 2003).	No. of Hours 36 12 100 Assessment Methods to CLO Mapping			

Degree Regulations

SCIENCE

SECTION X Degree Regulations

REGULATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE (BSc)

These regulations apply to students admitted under the 4-year '2012 curriculum' to the BSc degree curriculum to the first year in the academic year 2017-18 and thereafter, students admitted directly to the second year in the academic year 2018-19 and thereafter, and students admitted directly to the third year in the academic year 2019-20.

(See also General Regulations and Regulations for First Degree Curricula)

Definitions

Sc1¹ For the purpose of these regulations and the syllabuses for the BSc degree, unless the context otherwise requires:

"Science course" means any course offered by the Faculty of Science, and the School of Biomedical Sciences.

"Advanced Science course" means any level 3, 4 or above course offered by the Faculty of Science and the School of Biomedical Sciences.

"Course" means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

"Syllabus" means courses taught by departments, centres, and schools, offered under a degree curriculum.

"Credits" or "credit-units" means the value assigned to each course to indicate its study load relative to the total study load under a degree curriculum. The study load refers to the hours of student learning activities and experiences, both within and outside the classroom, and includes contact hours and time spent on assessment tasks and examinations. Candidates who satisfactorily complete courses with a credit value earn the credits assigned to these courses.

Admission to the BSc degree

Sc2 To be eligible for admission to the BSc degree, candidates shall:

- (a) comply with the General Regulations;
- (b) comply with the Regulations for First Degree Curricula; and
- (c) satisfy all the requirements of the curriculum in accordance with these regulations and the syllabuses.

Period of study

Sc3 The curriculum for the BSc degree shall normally require eight semesters of full-time study, extending over not fewer than four academic years, and shall include any assessment to be held during and/or at the end of each semester. Candidates shall not in any case be permitted to extend their studies beyond the maximum period of registration of six academic years.

¹ This regulation should be read in conjunction with UG1 of the Regulations for First Degree Curricula.

SECTION X Degree Regulations

REGULATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE (BSc)

These regulations apply to students admitted under the 4-year '2012 curriculum' to the BSc degree curriculum to the first year in the academic year 2017-18 and thereafter, students admitted directly to the second year in the academic year 2018-19 and thereafter, and students admitted directly to the third year in the academic year 2019-20 and thereafter.

(See also General Regulations and Regulations for First Degree Curricula)

Definitions

Sc1¹ For the purpose of these regulations and the syllabuses for the BSc degree, unless the context otherwise requires:

"Science course" means any course offered by the Faculty of Science, and the School of Biomedical Sciences.

"Advanced Science course" means any level 3, 4 or above course offered by the Faculty of Science and the School of Biomedical Sciences.

"Course" means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

"Syllabus" means courses taught by departments, centres, and schools, offered under a degree curriculum.

"Credits" or "credit-units" means the value assigned to each course to indicate its study load relative to the total study load under a degree curriculum. The study load refers to the hours of student learning activities and experiences, both within and outside the classroom, and includes contact hours and time spent on assessment tasks and examinations. Candidates who satisfactorily complete courses with a credit value earn the credits assigned to these courses.

Admission to the BSc degree

Sc2 To be eligible for admission to the BSc degree, candidates shall:

- (a) comply with the General Regulations;
- (b) comply with the Regulations for First Degree Curricula; and
- (c) satisfy all the requirements of the curriculum in accordance with these regulations and the syllabuses.

Period of study

Sc3 The curriculum for the BSc degree shall normally require eight semesters of full-time study, extending over not fewer than four academic years, and shall include any assessment to be held during and/or at the end of each semester. Candidates shall not in any case be permitted to extend their studies beyond the maximum period of registration of six academic years.

¹ This regulation should be read in conjunction with UG1 of the Regulations for First Degree Curricula.

Selection of courses

Sc4 Candidates shall select their courses in accordance with these regulations and the guidelines specified in the syllabuses before the beginning of each semester. Any change to the selection of courses shall be made only during the add/drop period of the semester in which the course begins, and such changes shall not be reflected in the transcript of the candidate. Requests for changes after the designated add/drop period of the semester shall not be considered.

Curriculum requirements and progression in curriculum

Sc5

- (a) Candidates shall satisfy the requirements prescribed in UG5 of the Regulations of First Degree Curricula.
- (b) Candidates shall take not fewer than 240 credits, in the manner specified in these regulations and the syllabuses.
- (c) Candidates shall take at least 96 credits of Science courses including all required courses of the major programme of the BSc degree curriculum.
- (d) Candidates shall normally be required to take not fewer than 24 credits nor more than 30 credits in any one semester (except the summer semester) unless otherwise permitted or required by the Board of the Faculty, or except in the last semester of study when the number of outstanding credits required to complete the curriculum requirements may be fewer than 24 credits.
- (e) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, and/or further credits during the summer semester, accumulating up to a maximum of 72 credits in one academic year. With the special permission of the Board of the Faculty, candidates may exceed the annual study load of 72 credits in a given academic year provided that the total number of credits taken does not exceed the maximum curriculum study load of 288 credits for the normative period of study specified in the curriculum regulations, save as provided for under Sc5(f).
- (f) Where candidates are required to make up for failed credits, the Board of the Faculty may give permission for candidates to exceed the annual study load of 72 credits provided that the total number of credits taken does not exceed the maximum curriculum study load of 432 credits for the maximum period of registration specified in the curriculum regulations.
- (g) Candidates may, with the approval of the Board of the Faculty, transfer credits for courses completed at other institutions at any time during their candidature. The number of transferred credits will be recorded on the transcript of the candidate, but the results of courses completed at other institutions shall not be included in the calculation of the GPA. The number of credits to be transferred shall not exceed half of the total credits normally required under the degree curricula of the candidates during their candidature at the University.
- (h) Candidates shall be recommended for discontinuation of their studies if they have:
 - (i) failed to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters, or
 - (ii) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters (not including the summer semester), or
 - (iii) exceeded the maximum period of registration specified in Sc3, unless otherwise permitted by the Board of the Faculty.

Advanced standing

Sc6 Advanced standing may be granted to candidates in recognition of studies completed successfully before admission to the curriculum in accordance with UG2 of the Regulations for First Degree Curricula. Credits granted for advanced standing will be recorded on the transcript of the candidate but shall not be included in the calculation of the GPA.

Assessment

Sc7

- (a) Candidates shall be assessed for each of the courses for which they have registered, and assessment may be conducted in any combination of continuous assessment of coursework, written examinations and/or any other assessable activities. Only passed courses will earn credits.
- (b) Candidates who are unable, because of illness, to be present at the written examination of any course may apply for permission to present themselves at a supplementary examination of the same course to be held before the beginning of the First Semester of the following academic year. Any such application shall be made on the form prescribed within two weeks of the first day of the candidate's absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.
- (c) Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.
- (d) Candidates are required to make up for failed courses in the following manner: repeating the failed course by undergoing instruction and satisfying the assessment, or for elective courses, taking another course in lieu and satisfying the assessment requirements.
- (e) There shall be no appeal against the results of examinations and all other forms of assessment.

Award of BSc Degree

- Sc8 To be eligible for the award of the BSc degree, candidates shall have:
- (a) satisfied the requirements in UG5 of the Regulations for First Degree Curricula;
- (b) passed not fewer than 240 credits, comprising 96 credits of the required courses as prescribed in the major programme of the BSc degree curriculum.

Honours classification

Sc9

(a) Honours classifications shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the Degree of BSc in accordance with the following Graduation GPA scores, with all courses taken (including failed courses, but not including courses approved by the Senate graded as 'Pass', 'Fail' or 'Distinction') carrying weightings which are proportionate to their credit values²:

Class of honours	GGPA range
First Class Honours	3.60 - 4.30
Second Class Honours	(2.40 - 3.59)
Division One	3.00 - 3.59
Division Two	2.40 - 2.99
Third Class Honours	1.70 - 2.39
Pass	1.00 - 1.69

- (b) Honours classification may not be determined solely on the basis of a candidate's Graduation GPA and the Board of Examiners for the Degree of BSc may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Graduation GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.
- (c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

For students in the 2017-18 intake and thereafter who have successfully completed six Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five Common Core course with the highest grades (covering all four Areas of Inquiry), or all six courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA.

REGULATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE (BSc)

These regulations apply to students admitted under the 4-year '2012 curriculum' to the BSc degree curriculum to the first year in the academic year 2015-16 and 2016-17, students admitted directly to the second year in the academic year 2017-18, and students admitted directly to the third year in the academic years 2017-18 and 2018-19.

(See also General Regulations and Regulations for First Degree Curricula)

Definitions

Sc1¹ For the purpose of these regulations and the syllabuses for the BSc degree, unless the context otherwise requires:

"Science course" means any course offered by the Faculty of Science, and the School of Biomedical Sciences.

"Advanced Science course" means any level 3, 4 or above course offered by the Faculty of Science and the School of Biomedical Sciences.

"Course" means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

"Syllabus" means courses taught by departments, centres, and schools, offered under a degree curriculum.

"Credits" or "credit-units" means the value assigned to each course to indicate its study load relative to the total study load under a degree curriculum. The study load refers to the hours of student learning activities and experiences, both within and outside the classroom, and includes contact hours and time spent on assessment tasks and examinations. Candidates who satisfactorily complete courses with a credit value earn the credits assigned to these courses.

Admission to the BSc degree

Sc2 To be eligible for admission to the BSc degree, candidates shall:

- (a) comply with the General Regulations;
- (b) comply with the Regulations for First Degree Curricula; and
- (c) satisfy all the requirements of the curriculum in accordance with these regulations and the syllabuses.

Period of study

Sc3 The curriculum for the BSc degree shall normally require eight semesters of full-time study, extending over not fewer than four academic years, and shall include any assessment to be held during and/or at the end of each semester. Candidates shall not in any case be permitted to extend their studies beyond the maximum period of registration of six academic years.

¹ This regulation should be read in conjunction with UG1 of the Regulations for First Degree Curricula.

Selection of courses

Sc4 Candidates shall select their courses in accordance with these regulations and the guidelines specified in the syllabuses before the beginning of each semester. Any change to the selection of courses shall be made only during the add/drop period of the semester in which the course begins, and such changes shall not be reflected in the transcript of the candidate. Requests for changes after the designated add/drop period of the semester shall not be considered.

Curriculum requirements and progression in curriculum

Sc5

- (a) Candidates shall satisfy the requirements prescribed in UG5 of the Regulations of First Degree Curricula.
- (b) Candidates shall take not fewer than 240 credits, in the manner specified in these regulations and the syllabuses.
- (c) Candidates shall take at least 96 credits of Science courses including all required courses of the major programme of the BSc degree curriculum.
- (d) Candidates shall normally be required to take not fewer than 24 credits nor more than 30 credits in any one semester (except the summer semester) unless otherwise permitted or required by the Board of the Faculty, or except in the last semester of study when the number of outstanding credits required to complete the curriculum requirements may be fewer than 24 credits.
- (e) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, and/or further credits during the summer semester, accumulating up to a maximum of 72 credits in one academic year. With the special permission of the Board of the Faculty, candidates may exceed the annual study load of 72 credits in a given academic year provided that the total number of credits taken does not exceed the maximum curriculum study load of 288 credits for the normative period of study specified in the curriculum regulations, save as provided for under Sc5(f).
- (f) Where candidates are required to make up for failed credits, the Board of the Faculty may give permission for candidates to exceed the annual study load of 72 credits provided that the total number of credits taken does not exceed the maximum curriculum study load of 432 credits for the maximum period of registration specified in the curriculum regulations.
- (g) Candidates may, with the approval of the Board of the Faculty, transfer credits for courses completed at other institutions at any time during their candidature. The number of transferred credits will be recorded on the transcript of the candidate, but the results of courses completed at other institutions shall not be included in the calculation of the GPA. The number of credits to be transferred shall not exceed half of the total credits normally required under the degree curricula of the candidates during their candidature at the University.
- (h) Candidates shall be recommended for discontinuation of their studies if they have:
 - (i) failed to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters, or
 - (ii) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters (not including the summer semester), or
 - (iii) exceeded the maximum period of registration specified in Sc3, unless otherwise permitted by the Board of the Faculty.

Advanced standing

Sc6 Advanced standing may be granted to candidates in recognition of studies completed successfully before admission to the curriculum in accordance with UG2 of the Regulations for First Degree Curricula. Credits granted for advanced standing will be recorded on the transcript of the candidate but shall not be included in the calculation of the GPA.

Assessment

Sc7

- (a) Candidates shall be assessed for each of the courses for which they have registered, and assessment may be conducted in any combination of continuous assessment of coursework, written examinations and/or any other assessable activities. Only passed courses will earn credits.
- (b) Candidates who are unable, because of illness, to be present at the written examination of any course may apply for permission to present themselves at a supplementary examination of the same course to be held before the beginning of the First Semester of the following academic year. Any such application shall be made on the form prescribed within two weeks of the first day of the candidate's absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.
- (c) Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.
- (d) Candidates are required to make up for failed courses in the following manner: repeating the failed course by undergoing instruction and satisfying the assessment, or for elective courses, taking another course in lieu and satisfying the assessment requirements.
- (e) There shall be no appeal against the results of examinations and all other forms of assessment.

Award of BSc Degree

- **Sc8** To be eligible for the award of the BSc degree, candidates shall have:
- (a) satisfied the requirements in UG5 of the Regulations for First Degree Curricula;
- (b) passed not fewer than 240 credits, comprising 96 credits of the required courses as prescribed in the major programme of the BSc degree curriculum.

Honours classification

Sc9

(a) Honours classifications shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the Degree of BSc in accordance with the following Graduation GPA scores, with all courses taken (including failed courses, but not including courses approved by the Senate graded as 'Pass', 'Fail' or 'Distinction') carrying weightings which are proportionate to their credit values²:

Class of honours	GGPA range
First Class Honours	3.60 - 4.30
Second Class Honours	(2.40 - 3.59)
Division One	3.00 - 3.59
Division Two	2.40 - 2.99
Third Class Honours	1.70 - 2.39
Pass	1.00 - 1.69

- (b) Honours classification may not be determined solely on the basis of a candidate's Graduation GPA and the Board of Examiners for the Degree of BSc may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Graduation GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.
- (c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

For students in the 2017-18 intake and thereafter who have successfully completed six Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five Common Core course with the highest grades (covering all four Areas of Inquiry), or all six courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA.

REGULATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE (BSc)

These regulations apply to students admitted under the 4-year '2012 curriculum' to the BSc degree curriculum to the first year in the academic years 2014-15, and students admitted directly to the third year in the academic years 2016-17.

(See also General Regulations and Regulations for First Degree Curricula)

Definitions

Sc1¹ For the purpose of these regulations and the syllabuses for the BSc degree, unless the context otherwise requires:

"Science course" means any course offered by the Faculty of Science, and the School of Biomedical Sciences.

"Advanced Science course" means any level 3, 4 or above course offered by the Faculty of Science and the School of Biomedical Sciences.

"Course" means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

"Syllabus" means courses taught by departments, centres, and schools, offered under a degree curriculum.

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Admission to the BSc degree

- Sc2 To be eligible for admission to the BSc degree, candidates shall:
- (a) comply with the General Regulations;
- (b) comply with the Regulations for First Degree Curricula; and
- (c) satisfy all the requirements of the curriculum in accordance with these regulations and the syllabuses.

Period of study

Sc3 The curriculum for the BSc degree shall normally require eight semesters of full-time study, extending over not fewer than four academic years, and shall include any assessment to be held during and/or at the end of each semester. Candidates shall not in any case be permitted to extend their studies beyond the maximum period of registration of six academic years.

Selection of courses

¹ This regulation should be read in conjunction with UG1 of the Regulations for First Degree Curricula.

Sc4 Candidates shall select their courses in accordance with these regulations and the guidelines specified in the syllabuses before the beginning of each semester. Any change to the selection of courses shall be made only during the add/drop period of the semester in which the course begins, and such changes shall not be reflected in the transcript of the candidate. Requests for changes after the designated add/drop period of the semester shall not be considered.

Curriculum requirements and progression in curriculum

Sc5

- (a) Candidates shall satisfy the requirements prescribed in UG5 of the Regulations of First Degree Curricula.
- (b) Candidates shall take not fewer than 240 credits, in the manner specified in these regulations and the syllabuses.
- (c) Candidates shall take at least 96 credits of Science courses including all required courses of the major programme of the BSc degree curriculum.
- (d) Candidates shall normally be required to take not fewer than 24 credits nor more than 30 credits in any one semester (except the summer semester) unless otherwise permitted or required by the Board of the Faculty, or except in the last semester of study when the number of outstanding credits required to complete the curriculum requirements may be fewer than 24 credits.
- (e) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, and/or further credits during the summer semester, accumulating up to a maximum of 72 credits in one academic year. With the special permission of the Board of the Faculty, candidates may exceed the annual study load of 72 credits in a given academic year provided that the total number of credits taken does not exceed the maximum curriculum study load of 288 credits for the normative period of study specified in the curriculum regulations, save as provided for under Sc5(f).
- (f) Where candidates are required to make up for failed credits, the Board of the Faculty may give permission for candidates to exceed the annual study load of 72 credits provided that the total number of credits taken does not exceed the maximum curriculum study load of 432 credits for the maximum period of registration specified in the curriculum regulations.
- (g) Candidates may, with the approval of the Board of the Faculty, transfer credits for courses completed at other institutions at any time during their candidature. The number of transferred credits will be recorded on the transcript of the candidate, but the results of courses completed at other institutions shall not be included in the calculation of the GPA. The number of credits to be transferred shall not exceed half of the total credits normally required under the degree curricula of the candidates during their candidature at the University.
- (h) Candidates shall be recommended for discontinuation of their studies if they have:
 - (i) failed to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters, or
 - (ii) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters (not including the summer semester), or
 - (iii) exceeded the maximum period of registration specified in Sc3, unless otherwise permitted by the Board of the Faculty.

Advanced standing

Sc6 Advanced standing may be granted to candidates in recognition of studies completed successfully before admission to the curriculum in accordance with UG2 of the Regulations for First Degree Curricula. Credits granted for advanced standing will be recorded on the transcript of the candidate but shall not be included in the calculation of the GPA.

Assessment

Sc7

- (a) Candidates shall be assessed for each of the courses for which they have registered, and assessment may be conducted in any combination of continuous assessment of coursework, written examinations and/or any other assessable activities. Only passed courses will earn credits.
- (b) Candidates who are unable, because of illness, to be present at the written examination of any course may apply for permission to present themselves at a supplementary examination of the same course to be held before the beginning of the First Semester of the following academic year. Any such application shall be made on the form prescribed within two weeks of the first day of the candidate's absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.
- (c) Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.
- (d) Candidates are required to make up for failed courses in the following manner: repeating the failed course by undergoing instruction and satisfying the assessment, or for elective courses, taking another course in lieu and satisfying the assessment requirements.
- (e) There shall be no appeal against the results of examinations and all other forms of assessment.

Award of BSc Degree

- Sc8 To be eligible for the award of the BSc degree, candidates shall have:
- (a) satisfied the requirements in UG5 of the Regulations for First Degree Curricula;
- (b) passed not fewer than 240 credits, comprising 96 credits of the required courses as prescribed in the major programme of the BSc degree curriculum.

Honours classification

Sc9

(a) Honours classifications shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the Degree of BSc in accordance with the following Cumulative GPA scores, with all courses taken (including failed courses, but not including courses approved by the Senate graded as 'Pass', 'Fail' or 'Distinction') carrying equal weighting:

Class of honours	<u>CGPA range</u>
First Class Honours	3.60 - 4.30
Second Class Honours	(2.40 - 3.59)
Division One	3.00 - 3.59
Division Two	2.40 - 2.99
Third Class Honours	1.70 - 2.39
Pass	1.00 - 1.69

- (b) Honours classification may not be determined solely on the basis of a candidate's Cumulative GPA and the Board of Examiners for the Degree of BSc may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Cumulative GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.
- (c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

REGULATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE (BSc)

These regulations apply to students admitted under the 4-year '2012 curriculum' to the BSc degree curriculum to the first year in the academic years 2012-13 and 2013-14, and students admitted directly to the third year in the academic years 2014-15 and 2015-16.

(See also General Regulations and Regulations for First Degree Curricula)

Definitions

Sc1¹ For the purpose of these regulations and the syllabuses for the BSc degree, unless the context otherwise requires:

"Science course" means any course offered by the Faculty of Science, and the School of Biomedical Sciences.

"Advanced Science course" means any level 3, 4 or above course offered by the Faculty of Science and the School of Biomedical Sciences.

"Course" means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

"Syllabus" means courses taught by departments, centres, and schools, offered under a degree curriculum.

"Credits" or "credit-units" means the value assigned to each course to indicate its study load relative to the total study load under a degree curriculum. The study load refers to the hours of student learning activities and experiences, both within and outside the classroom, and includes contact hours and time spent on assessment tasks and examinations. Candidates who satisfactorily complete courses with a credit value earn the credits assigned to these courses.

Admission to the BSc degree

- Sc2 To be eligible for admission to the BSc degree, candidates shall:
- (a) comply with the General Regulations;
- (b) comply with the Regulations for First Degree Curricula; and
- (c) satisfy all the requirements of the curriculum in accordance with these regulations and the syllabuses.

Period of study

Sc3 The curriculum for the BSc degree shall normally require eight semesters of full-time study, extending over not fewer than four academic years, and shall include any assessment to be held during and/or at the end of each semester. Candidates shall not in any case be permitted to extend their studies beyond the maximum period of registration of six academic years.

¹ This regulation should be read in conjunction with UG1 of the Regulations for First Degree Curricula.

Selection of courses

Sc4 Candidates shall select their courses in accordance with these regulations and the guidelines specified in the syllabuses before the beginning of each semester. Any change to the selection of courses shall be made only during the add/drop period of the semester in which the course begins, and such changes shall not be reflected in the transcript of the candidate. Requests for changes after the designated add/drop period of the semester shall not be considered.

Curriculum requirements and progression in curriculum

Sc5

- (a) Candidates shall satisfy the requirements prescribed in UG5 of the Regulations of First Degree Curricula.
- (b) Candidates shall take not fewer than 240 credits, in the manner specified in these regulations and the syllabuses.
- (c) Candidates shall take at least 96 credits of Science courses including all required courses of the major programme of the BSc degree curriculum.
- (d) Candidates shall normally be required to take not fewer than 24 credits nor more than 30 credits in any one semester (except the summer semester) unless otherwise permitted or required by the Board of the Faculty, or except in the last semester of study when the number of outstanding credits required to complete the curriculum requirements may be fewer than 24 credits.
- (e) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, and/or further credits during the summer semester, accumulating up to a maximum of 72 credits in one academic year. With the special permission of the Board of the Faculty, candidates may exceed the annual study load of 72 credits in a given academic year provided that the total number of credits taken does not exceed the maximum curriculum study load of 288 credits for the normative period of study specified in the curriculum regulations, save as provided for under Sc5(f).
- (f) Where candidates are required to make up for failed credits, the Board of the Faculty may give permission for candidates to exceed the annual study load of 72 credits provided that the total number of credits taken does not exceed the maximum curriculum study load of 432 credits for the maximum period of registration specified in the curriculum regulations.
- (g) Candidates may, with the approval of the Board of the Faculty, transfer credits for courses completed at other institutions at any time during their candidature. The number of transferred credits will be recorded on the transcript of the candidate, but the results of courses completed at other institutions shall not be included in the calculation of the GPA. The number of credits to be transferred shall not exceed half of the total credits normally required under the degree curricula of the candidates during their candidature at the University.
- (h) Candidates shall be recommended for discontinuation of their studies if they have:
 - (i) failed to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters, or
 - (ii) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters (not including the summer semester), or
 - (iii) exceeded the maximum period of registration specified in Sc3, unless otherwise permitted by the Board of the Faculty.

Advanced standing

Sc6 Advanced standing may be granted to candidates in recognition of studies completed successfully in an approved institution of higher education elsewhere in accordance with UG2 of the Regulations for First Degree Curricula. Credits granted for advanced standing will be recorded on the transcript of the candidate but shall not be included in the calculation of the GPA.

Assessment

Sc7

- (a) Candidates shall be assessed for each of the courses for which they have registered, and assessment may be conducted in any combination of continuous assessment of coursework, written examinations and/or any other assessable activities. Only passed courses will earn credits.
- (b) Candidates who are unable, because of illness, to be present at the written examination of any course may apply for permission to present themselves at a supplementary examination of the same course to be held before the beginning of the First Semester of the following academic year. Any such application shall be made on the form prescribed within two weeks of the first day of the candidate's absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.
- (c) Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.
- (d) Candidates are required to make up for failed courses in the following manner: repeating the failed course by undergoing instruction and satisfying the assessment, or for elective courses, taking another course in lieu and satisfying the assessment requirements.
- (e) There shall be no appeal against the results of examinations and all other forms of assessment.

Award of BSc Degree

- **Sc8** To be eligible for the award of the BSc degree, candidates shall have:
- (a) satisfied the requirements in UG5 of the Regulations for First Degree Curricula;
- (b) passed not fewer than 240 credits, comprising 96 credits of the required courses as prescribed in the major programme of the BSc degree curriculum.

Honours classification

Sc9

(a) Honours classifications shall be awarded in five divisions: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the Degree of BSc in accordance with the following Cumulative GPA scores, with all courses taken (including failed courses, but not including courses approved by the Senate graded as 'Pass', 'Fail' or 'Distinction') carrying equal weighting:

Class of honours	<u>CGPA range</u>
First Class Honours	3.60 - 4.30
Second Class Honours	(2.40 - 3.59)
Division One	3.00 - 3.59
Division Two	2.40 - 2.99
Third Class Honours	1.70 - 2.39
Pass	1.00 - 1.69

- (b) Honours classification may not be determined solely on the basis of a candidate's Cumulative GPA and the Board of Examiners for the Degree of BSc may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Cumulative GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.
- (c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

REGULATIONS FOR FIRST DEGREE CURRICULA

Regulations for First Degree Curricula (for students admitted under the 4-year '2012 curriculum' to the first year in the academic year 2019-20 and thereafter)

(See also General Regulations)

UG1 Definitions:

For the purpose of regulations and syllabuses for all first degree curricula unless otherwise defined —

An 'academic year' comprises two semesters, the first semester to commence in September and end in December, and the second semester to commence in January and end in May/June, on dates as prescribed by the Senate. It includes, normally at the end of each semester, a period during which candidates are assessed. For some curricula, a 'summer semester' may be organized in addition to the normal two semesters. Clinical curricula have extended semesters.

A 'summer semester' normally comprises seven to eight weeks of intensive timetabled teaching and assessment to commence four weeks after the end of the second semester assessment period, and to conclude about one week before the start of the next academic year.

The 'maximum period of registration' is equivalent to a period which is 150% of the curriculum's normative period of study as specified in the degree regulations, provided that where this results in a residual fraction of an academic year, the fractional period shall be extended to one full academic year.

'Degree curriculum' means the entire study requirements for the award of an undergraduate degree.

'Major programme' means the study requirements, including a capstone experience, for a single major area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 72 credits nor more than 96 credits, as prescribed in the syllabuses for a degree curriculum.

'Minor programme' means the study requirements for a single minor area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 36 credits nor more than 48 credits, as prescribed in the syllabuses for a degree curriculum.

'Professional core' refers to the study requirements, including a capstone experience, prescribed in the regulations and syllabuses for disciplinary studies in degree curricula which are not structured as major/minor programmes for reasons relating to professional qualification and/or accreditation.

'Course' means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

'Disciplinary elective course' or 'Disciplinary Elective' means any course offered in the same major or minor programme or the professional core which can be taken by candidates to fulfill the curriculum requirements as specified in the syllabuses of the degree curriculum.

'Elective course' or 'Elective' means any course offered within the same or another curriculum, other than compulsory courses in the candidate's degree curriculum, that can be

¹ These regulations are applicable to candidates admitted from 2019-20 onwards. Reference in these regulations to the powers of the Boards of Faculties shall be applicable to Senate Boards of Studies which administer first degree curricula.

taken by the candidate in order to complete the credit requirements of the degree curriculum.

'Capstone experience' refers to one or more courses within the major programme or professional core which are approved by the Board of the Faculty for the purpose of integrating knowledge and skills acquired, and which are prescribed in the syllabuses of the degree curriculum.

'Syllabus' means courses taught by departments, centres, and schools, offered under a degree curriculum.

'Prerequisite' means a course or a group of courses which candidates must have completed successfully or a requirement which candidates must have fulfilled before being permitted to take the course in question.

'Corequisite' means a course which candidates must take in conjunction with the course in question.

'Credits' or 'credit-units' means the value assigned to each course to indicate its study load relative to the total study load under a degree curriculum. The study load refers to the hours of student learning activities and experiences, both within and outside the classroom, and includes contact hours and time spent on assessment tasks and examinations. Candidates who satisfactorily complete courses with a credit value earn the credits assigned to these courses.

'Grade Points' are standardized measurements of candidates' academic achievement in courses taken to satisfy the requirements of the degree curriculum and are expressed as a scale prescribed in these regulations.

'Grade Point Average' is a numerical measure of a candidate's academic achievement over a specified period of time. Each course attempted (including each failed course) is assigned a numerical value, with all courses carrying equal weighting. This numerical value is the product of grade points earned for the course and the credit value of that course. The 'Grade Point Average' is the sum of these numerical values divided by the total number of credits attempted:

$$GPA = \frac{\sum\limits_{i}^{\Sigma} Course \ Grade \ Point \times Course \ Credit \ Value}{\sum\limits_{i}^{\Sigma} Course \ Credit \ Value}$$

(where 'i' stands for all passed and failed courses taken by the student over a specified period)

'Semester Grade Point Average' or 'Semester GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) during a given semester.

'Year Grade Point Average' or 'Year GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) during a given academic year.

'Cumulative Grade Point Average' or 'Cumulative GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) at the time of calculation.

'Graduation Grade Point Average' or 'Graduation GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) at the point of graduation. For students in the 2017-18 intake and thereafter who have successfully completed six Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five Common Core courses with the highest grades (covering all four Areas of Inquiry), or all six courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA.

'Assessment' refers to judgment about the quality and extent to which a student has achieved the stated learning objectives or learning outcomes. It includes all types of assessment activities which allow for such a judgment to be made. For the purpose of interpreting the relevant provisions of the Ordinance and the Statutes and where appropriate,

reference to 'examination' or 'examinations' in the Ordinance and the Statutes shall include and cover all forms of 'assessment' and its related processes.

A 'transcript' refers to a transcript of the record of study of a candidate, issued by the Registry of the University.

UG 2 Advanced standing:

Advanced standing may be granted to candidates in recognition of studies completed successfully before admission to the curriculum. Candidates who are awarded Advanced Standing will not be granted any further credit transfer for those studies for which Advanced Standing has been granted. The amount of credits to be granted for advanced standing shall be determined by the Board of the Faculty, in accordance with the following principles:

- (a) at least half the number of credits of the degree curriculum normally required for award of the degree shall be accumulated through study at this University or from transfer of credits for courses completed at other institutions in accordance with Regulation UG 4(d); and
- (b) in accordance with Statute III.5 and notwithstanding the granting of advanced and/or transfer credits, a minimum of two semesters of study at this University shall be required before a candidate is considered for the award of a first degree, other than a degree in medicine or surgery, and a minimum of four semesters of study at this University shall be required before a candidate is considered for a first degree in medicine or surgery.

Credits granted for advanced standing shall not normally be included in the calculation of the GPA unless permitted by the Board of the Faculty but will be recorded on the transcript of the candidate.

UG 3 Period of study:

The period of study of the curriculum shall be specified in the regulations governing the degree. To be eligible for award of the degree, a candidate shall fulfill all curriculum requirements within the maximum period of registration, unless otherwise permitted or required by the Board of the Faculty.

UG 4 Progression in curriculum:

- (a) Candidates shall normally be required to take not fewer than 24 credits nor more than 30 credits in any one semester (except the summer semester) unless otherwise permitted or required by the Board of the Faculty, or except in the last semester of study when the number of outstanding credits required to complete the curriculum requirements is fewer than 24 credits.
- (b) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, and/or further credits during the summer semester, accumulating up to a maximum of 72 credits in one academic year. With the special permission of the Board of the Faculty, candidates may exceed the annual study load of 72 credits in a given academic year provided that the total number of credits taken does not exceed the maximum curriculum study load for the normative period of study specified in the curriculum regulations, save as provided for under UG4(c).
- (c) Where candidates are required to make up for failed credits, the Board of the Faculty may give permission for candidates to exceed the annual study load of 72 credits provided that the total number of credits taken does not exceed the maximum curriculum study load for the maximum period of registration specified in the curriculum regulations.
- (d) Candidates may, with the approval of the Board of the Faculty, transfer credits for courses completed at other institutions at any time during their candidature. The

number of transferred credits may be recorded in the transcript of the candidate, but the results of courses completed at other institutions shall not be included in the calculation of the GPA. The number of credits to be transferred shall not exceed half of the total credits normally required under the degree curricula of the candidates during their candidature at the University.

- (e) Unless otherwise permitted by the Board of the Faculty, candidates shall be recommended for discontinuation of their studies if they have:
 - (i) failed to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters, or
 - (ii) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters (not including the summer semester), or
 - (iii) exceeded the maximum period of registration specified in the regulations of the degree.

UG 5 Requirements for graduation:

To be eligible for admission to the degree, candidates shall fulfill the following requirements in addition to the requirements prescribed in the regulations and syllabuses governing the degree curriculum within the maximum period of registration:

- (a) successful completion of 12 credits in English language enhancement, including 6 credits in Core University English² and 6 credits in an English in the Discipline course³;
- (b) successful completion of 6 credits in Chinese language enhancement⁴;
- (c) unless otherwise prescribed in the curriculum regulations and syllabuses, successful completion of 36 credits of courses in the Common Core Curriculum, comprising at least one and not more than two courses from each Area of Inquiry⁵ with not more than 24 credits of course being selected within one academic year except where candidates are required to make up for failed credits; and
- (d) successful completion of a capstone experience as specified in the syllabuses of the degree curriculum.

UG 6 Exemption:

Candidates may be exempted, with or without special conditions attached, from any of the requirements in UG 5 by the Senate in exceptional circumstances. Candidates who are so

² Candidates who have achieved Level 5** in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent, may at the discretion of the Faculty be exempted from this requirement and should take an elective course in lieu, see *Regulation UG6*.

³ (a) To satisfy the English in the Discipline (ED) requirement, candidates who have passed the ED course for a Major but subsequently change that Major are required to pass the ED course for the new Major, or either of the double Majors finally declared upon graduation irrespective of whether the second Major is offered within or outside of the candidates' home Faculty.

⁽b) Candidates declaring double Majors can, if they fail in the ED course for one of the Majors, either (i) re-take and successfully complete that failed ED course, or (ii) successfully complete the ED course for the other Major, irrespective of whether the Major is offered within or outside of the candidates' home Faculty.

⁽c) Candidates who undertake studies in double Majors or double degrees are not required to take a second ED course but may be advised by the Faculty to do so.

⁴ Candidates who have not studied Chinese language during their secondary education may be exempted from this requirement and should take an elective course in lieu, see *Regulation UG6*.

⁵ Candidates registered for dual degree studies are required to successfully complete 24 credits of courses in the Common Core Curriculum, selecting one course from each Area of Inquiry, within the curriculum of the first degree, as appropriate.

exempted must replace the number of exempted credits with courses of the same credit value.

UG7 Assessment:

(a) Candidates shall be assessed for each of the courses for which they have registered, and assessment may be conducted in any combination of continuous assessment of coursework, written examinations and/or any other assessable activities. Only passed courses will earn credits.

- (b) Candidates who are unable, because of illness, to be present at the written examination of any course may apply for permission to present themselves at a supplementary examination of the same course to be held before the beginning of the First Semester of the following academic year. Any such application shall be made on the form prescribed within two weeks of the first day of the candidate's absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.
- (c) Candidates suspended under Statute XXXI shall not be allowed to take, present themselves for, and participate in any assessments during the period of suspension, unless otherwise permitted by the Senate.
- (d) Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.
- (e) Candidates are required to make up for failed courses in the following manner as prescribed in the curriculum regulations:
 - (i) undergoing re-assessment/re-examination in the failed course to be held no later than the end of the following semester (not including the summer semester); or
 - (ii) re-submitting failed coursework, without having to repeat the same course of instruction; or
 - (iii) repeating the failed course by undergoing instruction and satisfying the assessments;
 - (iv) for elective courses, taking another course *in lieu* and satisfying the assessment requirements.
- (f) There shall be no appeal against the results of examinations and all other forms of assessment.

UG 8 Grading system:

(a) The grades, their standards and the grade points for assessment shall be as follows⁶:

	Standard	Grade Point
1		4.3
}	Excellent	4.0
J		3.7
1		3.3
}	Good	3.0
J		2.7
1		2.3
}	Satisfactory	2.0
J	•	1.7
l	Dogg	1.3
ſ	rass	1.0
	Fail	0
	<pre>} } }</pre>	<pre> Excellent } Good Satisfactory Pass</pre>

⁶ UG 8 is not applicable to the respective Professional Core of the BDS and MBBS curricula.

(b) Special permission may be given by Senate for courses in individual curricula to be graded as 'Pass', 'Fail' or 'Distinction'. Such courses will not be included in the calculation of the GPA.

UG9 Honours classifications:

(a) Honours classifications shall be awarded in five divisions⁷: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the degree in accordance with the following Graduate GPA scores, with all courses taken (including failed courses) carrying equal weighting which are proportionate to their credit values⁸:

<u>Class of honours</u>	<u>GGPA range</u>
First Class Honours	3.60 - 4.30
Second Class Honours	(2.40 - 3.59)
Division One	3.00 - 3.59
Division Two	2.40 - 2.99
Third Class Honours	1.70 - 2.39
Pass	1.00 - 1.69

- (b) Honours classification may not be determined solely on the basis of a candidate's Graduation GPA and the Board of Examiners for the degree may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Graduation GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.
- (c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

⁷ UG 9 is not applicable to the BChinMed, BDS and MBBS curricula.

⁸ For students in the 2017-18 intake and thereafter who have successfully completed six Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five Common Core course with the highest grades (covering all four Areas of Inquiry), or all six courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA.

REGULATIONS FOR FIRST DEGREE CURRICULA

Regulations for First Degree Curricula (for students admitted under the 4-year '2012 curriculum' to the first year in the academic year 2018-19, and students admitted directly to the second year in the academic year 2019-20)

(See also General Regulations)

UG1 Definitions:

For the purpose of regulations and syllabuses for all first degree curricula unless otherwise defined —

An 'academic year' comprises two semesters, the first semester to commence in September and end in December, and the second semester to commence in January and end in May/June, on dates as prescribed by the Senate. It includes, normally at the end of each semester, a period during which candidates are assessed. For some curricula, a 'summer semester' may be organized in addition to the normal two semesters. Clinical curricula have extended semesters.

A 'summer semester' normally comprises seven to eight weeks of intensive timetabled teaching and assessment to commence four weeks after the end of the second semester assessment period, and to conclude about one week before the start of the next academic year.

The 'maximum period of registration' is equivalent to a period which is 150% of the curriculum's normative period of study as specified in the degree regulations, provided that where this results in a residual fraction of an academic year, the fractional period shall be extended to one full academic year.

'Degree curriculum' means the entire study requirements for the award of an undergraduate degree.

'Major programme' means the study requirements, including a capstone experience, for a single major area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 72 credits nor more than 96 credits, as prescribed in the syllabuses for a degree curriculum.

'Minor programme' means the study requirements for a single minor area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 36 credits nor more than 48 credits, as prescribed in the syllabuses for a degree curriculum.

'Professional core' refers to the study requirements, including a capstone experience, prescribed in the regulations and syllabuses for disciplinary studies in degree curricula which are not structured as major/minor programmes for reasons relating to professional qualification and/or accreditation.

'Course' means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

'Disciplinary elective course' or 'Disciplinary Elective' means any course offered in the same major or minor programme or the professional core which can be taken by candidates to fulfill the curriculum requirements as specified in the syllabuses of the degree curriculum.

'Elective course' or 'Elective' means any course offered within the same or another curriculum, other than compulsory courses in the candidate's degree curriculum, that can be

¹ These regulations are applicable to candidates admitted from 2018-19 onwards. Reference in these regulations to the powers of the Boards of Faculties shall be applicable to Senate Boards of Studies which administer first degree curricula.

taken by the candidate in order to complete the credit requirements of the degree curriculum.

'Capstone experience' refers to one or more courses within the major programme or professional core which are approved by the Board of the Faculty for the purpose of integrating knowledge and skills acquired, and which are prescribed in the syllabuses of the degree curriculum.

'Syllabus' means courses taught by departments, centres, and schools, offered under a degree curriculum.

'Prerequisite' means a course or a group of courses which candidates must have completed successfully or a requirement which candidates must have fulfilled before being permitted to take the course in question.

'Corequisite' means a course which candidates must take in conjunction with the course in question.

'Credits' or 'credit-units' means the value assigned to each course to indicate its study load relative to the total study load under a degree curriculum. The study load refers to the hours of student learning activities and experiences, both within and outside the classroom, and includes contact hours and time spent on assessment tasks and examinations. Candidates who satisfactorily complete courses with a credit value earn the credits assigned to these courses.

'Grade Points' are standardized measurements of candidates' academic achievement in courses taken to satisfy the requirements of the degree curriculum and are expressed as a scale prescribed in these regulations.

'Grade Point Average' is a numerical measure of a candidate's academic achievement over a specified period of time. Each course attempted (including each failed course) is assigned a numerical value, with all courses carrying equal weighting. This numerical value is the product of grade points earned for the course and the credit value of that course. The 'Grade Point Average' is the sum of these numerical values divided by the total number of credits attempted:

$$GPA = \frac{\sum\limits_{i}^{\Sigma} Course \ Grade \ Point \times Course \ Credit \ Value}{\sum\limits_{i}^{\Sigma} Course \ Credit \ Value}$$

(where 'i' stands for all passed and failed courses taken by the student over a specified period)

'Semester Grade Point Average' or 'Semester GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) during a given semester.

'Year Grade Point Average' or 'Year GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) during a given academic year.

'Cumulative Grade Point Average' or 'Cumulative GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) at the time of calculation.

'Graduation Grade Point Average' or 'Graduation GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) at the point of graduation. For students in the 2017-18 intake and thereafter who have successfully completed six Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five Common Core courses with the highest grades (covering all four Areas of Inquiry), or all six courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA.

'Assessment' refers to judgment about the quality and extent to which a student has achieved the stated learning objectives or learning outcomes. It includes all types of assessment activities which allow for such a judgment to be made. For the purpose of interpreting the relevant provisions of the Ordinance and the Statutes and where appropriate,

reference to 'examination' or 'examinations' in the Ordinance and the Statutes shall include and cover all forms of 'assessment' and its related processes.

A 'transcript' refers to a transcript of the record of study of a candidate, issued by the Registry of the University.

UG 2 Advanced standing:

Advanced standing may be granted to candidates in recognition of studies completed successfully before admission to the curriculum. Candidates who are awarded Advanced Standing will not be granted any further credit transfer for those studies for which Advanced Standing has been granted. The amount of credits to be granted for advanced standing shall be determined by the Board of the Faculty, in accordance with the following principles:

- (a) at least half the number of credits of the degree curriculum normally required for award of the degree shall be accumulated through study at this University or from transfer of credits for courses completed at other institutions in accordance with Regulation UG 4(d); and
- (b) in accordance with Statute III.5 and notwithstanding the granting of advanced and/or transfer credits, a minimum of two semesters of study at this University shall be required before a candidate is considered for the award of a first degree, other than a degree in medicine or surgery, and a minimum of four semesters of study at this University shall be required before a candidate is considered for a first degree in medicine or surgery.

Credits granted for advanced standing shall not normally be included in the calculation of the GPA unless permitted by the Board of the Faculty but will be recorded on the transcript of the candidate.

UG 3 Period of study:

The period of study of the curriculum shall be specified in the regulations governing the degree. To be eligible for award of the degree, a candidate shall fulfill all curriculum requirements within the maximum period of registration, unless otherwise permitted or required by the Board of the Faculty.

UG 4 Progression in curriculum:

- (a) Candidates shall normally be required to take not fewer than 24 credits nor more than 30 credits in any one semester (except the summer semester) unless otherwise permitted or required by the Board of the Faculty, or except in the last semester of study when the number of outstanding credits required to complete the curriculum requirements is fewer than 24 credits.
- (b) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, and/or further credits during the summer semester, accumulating up to a maximum of 72 credits in one academic year. With the special permission of the Board of the Faculty, candidates may exceed the annual study load of 72 credits in a given academic year provided that the total number of credits taken does not exceed the maximum curriculum study load for the normative period of study specified in the curriculum regulations, save as provided for under UG4(c).
- (c) Where candidates are required to make up for failed credits, the Board of the Faculty may give permission for candidates to exceed the annual study load of 72 credits provided that the total number of credits taken does not exceed the maximum curriculum study load for the maximum period of registration specified in the curriculum regulations.
- (d) Candidates may, with the approval of the Board of the Faculty, transfer credits for courses completed at other institutions at any time during their candidature. The

number of transferred credits may be recorded in the transcript of the candidate, but the results of courses completed at other institutions shall not be included in the calculation of the GPA. The number of credits to be transferred shall not exceed half of the total credits normally required under the degree curricula of the candidates during their candidature at the University.

- (e) Unless otherwise permitted by the Board of the Faculty, candidates shall be recommended for discontinuation of their studies if they have:
 - (i) failed to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters, or
 - (ii) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters (not including the summer semester), or
 - (iii) exceeded the maximum period of registration specified in the regulations of the degree.

UG 5 Requirements for graduation:

To be eligible for admission to the degree, candidates shall fulfill the following requirements in addition to the requirements prescribed in the regulations and syllabuses governing the degree curriculum within the maximum period of registration:

- (a) successful completion of 12 credits in English language enhancement, including 6 credits in Core University English² and 6 credits in an English in the Discipline course³;
- (b) successful completion of 6 credits in Chinese language enhancement⁴;
- (c) successful completion of 36 credits of courses in the Common Core Curriculum, comprising at least one and not more than two courses from each Area of Inquiry⁵ with not more than 24 credits of course being selected within one academic year except where candidates are required to make up for failed credits; and
- (d) successful completion of a capstone experience as specified in the syllabuses of the degree curriculum.

UG 6 Exemption:

Candidates may be exempted, with or without special conditions attached, from any of the requirements in UG 5 by the Senate in exceptional circumstances. Candidates who are so exempted must replace the number of exempted credits with courses of the same credit value.

² Candidates who have achieved Level 5** in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent, may at the discretion of the Faculty be exempted from this requirement and should take an elective course in lieu, see *Regulation UG6*.

³ (a) To satisfy the English in the Discipline (ED) requirement, candidates who have passed the ED course for a Major but subsequently change that Major are required to pass the ED course for the new Major, or either of the double Majors finally declared upon graduation irrespective of whether the second Major is offered within or outside of the candidates' home Faculty.

⁽b) Candidates declaring double Majors can, if they fail in the ED course for one of the Majors, either (i) re-take and successfully complete that failed ED course, or (ii) successfully complete the ED course for the other Major, irrespective of whether the Major is offered within or outside of the candidates' home Faculty.

⁽c) Candidates who undertake studies in double Majors or double degrees are not required to take a second ED course but may be advised by the Faculty to do so.

⁴ Candidates who have not studied Chinese language during their secondary education may be exempted from this requirement and should take an elective course in lieu, see *Regulation UG6*.

⁵ Candidates registered for dual degree studies are required to successfully complete 24 credits of courses in the Common Core Curriculum, selecting one course from each Area of Inquiry, within the curriculum of the first degree, as appropriate.

UG7 Assessment:

- (a) Candidates shall be assessed for each of the courses for which they have registered, and assessment may be conducted in any combination of continuous assessment of coursework, written examinations and/or any other assessable activities. Only passed courses will earn credits.
- (b) Candidates who are unable, because of illness, to be present at the written examination of any course may apply for permission to present themselves at a supplementary examination of the same course to be held before the beginning of the First Semester of the following academic year. Any such application shall be made on the form prescribed within two weeks of the first day of the candidate's absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.
- (c) Candidates suspended under Statute XXXI shall not be allowed to take, present themselves for, and participate in any assessments during the period of suspension, unless otherwise permitted by the Senate.
- (d) Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.
- (e) Candidates are required to make up for failed courses in the following manner as prescribed in the curriculum regulations:
 - (i) undergoing re-assessment/re-examination in the failed course to be held no later than the end of the following semester (not including the summer semester); or
 - (ii) re-submitting failed coursework, without having to repeat the same course of instruction; or
 - (iii) repeating the failed course by undergoing instruction and satisfying the assessments; or
 - (iv) for elective courses, taking another course *in lieu* and satisfying the assessment requirements.
- (f) There shall be no appeal against the results of examinations and all other forms of assessment.

UG 8 Grading system:

(a) The grades, their standards and the grade points for assessment shall be as follows⁶:

Grade		Standard	Grade Point
A+	1		4.3
A	}	Excellent	4.0
A-	J		3.7
B+	1		3.3
В	}	Good	3.0
B-	J		2.7
C+	1		2.3
\mathbf{C}	}	Satisfactory	2.0
C-	J	•	1.7
D+	l	Dogg	1.3
D	ſ	Pass	1.0
F		Fail	0

(b) Special permission may be given by Senate for courses in individual curricula to be

⁶ UG 8 is not applicable to the respective Professional Core of the BDS and MBBS curricula.

graded as 'Pass', 'Fail' or 'Distinction'. Such courses will not be included in the calculation of the GPA.

UG9 Honours classifications:

(a) Honours classifications shall be awarded in five divisions⁷: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the degree in accordance with the following Graduate GPA scores, with all courses taken (including failed courses) carrying equal weighting which are proportionate to their credit values⁸:

Class of honours	GGPA range
First Class Honours	3.60 - 4.30
Second Class Honours	(2.40 - 3.59)
Division One	3.00 - 3.59
Division Two	2.40 - 2.99
Third Class Honours	1.70 - 2.39
Pass	1.00 - 1.69

- (b) Honours classification may not be determined solely on the basis of a candidate's Graduation GPA and the Board of Examiners for the degree may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Graduation GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.
- (c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

⁷ UG 9 is not applicable to the BChinMed, BDS and MBBS curricula.

⁸ For students in the 2017-18 intake and thereafter who have successfully completed six Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five Common Core course with the highest grades (covering all four Areas of Inquiry), or all six courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA.

REGULATIONS FOR FIRST DEGREE CURRICULA

Regulations for First Degree Curricula (for students admitted under the 4-year '2012 curriculum' to the first year in the academic year 2017-18, students admitted directed to the second year in the academic year 2018-19 and students admitted directly to the third year in the academic year 2019-20)

(See also General Regulations)

UG1 Definitions:

For the purpose of regulations and syllabuses for all first degree curricula unless otherwise defined —

An 'academic year' comprises two semesters, the first semester to commence in September and end in December, and the second semester to commence in January and end in May/June, on dates as prescribed by the Senate. It includes, normally at the end of each semester, a period during which candidates are assessed. For some curricula, a 'summer semester' may be organized in addition to the normal two semesters. Clinical curricula have extended semesters.

A 'summer semester' normally comprises seven to eight weeks of intensive timetabled teaching and assessment to commence four weeks after the end of the second semester assessment period, and to conclude about one week before the start of the next academic year.

The 'maximum period of registration' is equivalent to a period which is 150% of the curriculum's normative period of study as specified in the degree regulations, provided that where this results in a residual fraction of an academic year, the fractional period shall be extended to one full academic year.

'Degree curriculum' means the entire study requirements for the award of an undergraduate degree.

'Major programme' means the study requirements, including a capstone experience, for a single major area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 72 credits nor more than 96 credits, as prescribed in the syllabuses for a degree curriculum.

'Minor programme' means the study requirements for a single minor area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 36 credits nor more than 48 credits, as prescribed in the syllabuses for a degree curriculum.

'Professional core' refers to the study requirements, including a capstone experience, prescribed in the regulations and syllabuses for disciplinary studies in degree curricula which are not structured as major/minor programmes for reasons relating to professional qualification and/or accreditation.

'Course' means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

'Disciplinary elective course' or 'Disciplinary Elective' means any course offered in the same major or minor programme or the professional core which can be taken by candidates to fulfill the curriculum requirements as specified in the syllabuses of the degree curriculum.

¹ These regulations are applicable to candidates admitted from 2017-18 onwards. Reference in these regulations to the powers of the Boards of Faculties shall be applicable to Senate Boards of Studies which administer first degree curricula.

'Elective course' or 'Elective' means any course offered within the same or another curriculum, other than compulsory courses in the candidate's degree curriculum, that can be taken by the candidate in order to complete the credit requirements of the degree curriculum.

'Capstone experience' refers to one or more courses within the major programme or professional core which are approved by the Board of the Faculty for the purpose of integrating knowledge and skills acquired, and which are prescribed in the syllabuses of the degree curriculum.

'Syllabus' means courses taught by departments, centres, and schools, offered under a degree curriculum.

'Prerequisite' means a course or a group of courses which candidates must have completed successfully or a requirement which candidates must have fulfilled before being permitted to take the course in question.

'Corequisite' means a course which candidates must take in conjunction with the course in question.

'Credits' or 'credit-units' means the value assigned to each course to indicate its study load relative to the total study load under a degree curriculum. The study load refers to the hours of student learning activities and experiences, both within and outside the classroom, and includes contact hours and time spent on assessment tasks and examinations. Candidates who satisfactorily complete courses with a credit value earn the credits assigned to these courses.

'Grade Points' are standardized measurements of candidates' academic achievement in courses taken to satisfy the requirements of the degree curriculum and are expressed as a scale prescribed in these regulations.

'Grade Point Average' is a numerical measure of a candidate's academic achievement over a specified period of time. Each course attempted (including each failed course) is assigned a numerical value, with all courses carrying equal weighting. This numerical value is the product of grade points earned for the course and the credit value of that course. The 'Grade Point Average' is the sum of these numerical values divided by the total number of credits attempted:

$$GPA = \frac{\sum\limits_{i}^{\sum} Course\ Grade\ Point \times Course\ Credit\ Value}{\sum\limits_{i}^{\sum} Course\ Credit\ Value}$$

(where 'i' stands for all passed and failed courses taken by the student over a specified period)

'Semester Grade Point Average' or 'Semester GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) during a given semester.

'Year Grade Point Average' or 'Year GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) during a given academic year.

'Cumulative Grade Point Average' or 'Cumulative GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) at the time of calculation.

'Graduation Grade Point Average' or 'Graduation GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) at the point of graduation. For students in the 2017-18 intake and thereafter who have successfully completed six Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five Common Core courses with the highest grades (covering all four Areas of Inquiry), or all six courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA.

'Assessment' refers to judgment about the quality and extent to which a student has achieved the stated learning objectives or learning outcomes. It includes all types of

assessment activities which allow for such a judgment to be made. For the purpose of interpreting the relevant provisions of the Ordinance and the Statutes and where appropriate, reference to 'examination' or 'examinations' in the Ordinance and the Statutes shall include and cover all forms of 'assessment' and its related processes.

A 'transcript' refers to a transcript of the record of study of a candidate, issued by the Registry of the University.

UG 2 Advanced standing:

Advanced standing may be granted to candidates in recognition of studies completed successfully before admission to the curriculum. Candidates who are awarded Advanced Standing will not be granted any further credit transfer for those studies for which Advanced Standing has been granted. The amount of credits to be granted for advanced standing shall be determined by the Board of the Faculty, in accordance with the following principles:

- (a) at least half the number of credits of the degree curriculum normally required for award of the degree shall be accumulated through study at this University or from transfer of credits for courses completed at other institutions in accordance with Regulation UG 4(d); and
- (b) in accordance with Statute III.5 and notwithstanding the granting of advanced and/or transfer credits, a minimum of two semesters of study at this University shall be required before a candidate is considered for the award of a first degree, other than a degree in medicine or surgery, and a minimum of four semesters of study at this University shall be required before a candidate is considered for a first degree in medicine or surgery.

Credits granted for advanced standing shall not normally be included in the calculation of the GPA unless permitted by the Board of the Faculty but will be recorded on the transcript of the candidate.

UG 3 Period of study:

The period of study of the curriculum shall be specified in the regulations governing the degree. To be eligible for award of the degree, a candidate shall fulfill all curriculum requirements within the maximum period of registration, unless otherwise permitted or required by the Board of the Faculty.

UG 4 Progression in curriculum:

- (a) Candidates shall normally be required to take not fewer than 24 credits nor more than 30 credits in any one semester (except the summer semester) unless otherwise permitted or required by the Board of the Faculty, or except in the last semester of study when the number of outstanding credits required to complete the curriculum requirements is fewer than 24 credits.
- (b) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, and/or further credits during the summer semester, accumulating up to a maximum of 72 credits in one academic year. With the special permission of the Board of the Faculty, candidates may exceed the annual study load of 72 credits in a given academic year provided that the total number of credits taken does not exceed the maximum curriculum study load for the normative period of study specified in the curriculum regulations, save as provided for under UG4(c).
- (c) Where candidates are required to make up for failed credits, the Board of the Faculty may give permission for candidates to exceed the annual study load of 72 credits provided that the total number of credits taken does not exceed the maximum curriculum study load for the maximum period of registration specified in the curriculum regulations.

- (d) Candidates may, with the approval of the Board of the Faculty, transfer credits for courses completed at other institutions at any time during their candidature. The number of transferred credits may be recorded in the transcript of the candidate, but the results of courses completed at other institutions shall not be included in the calculation of the GPA. The number of credits to be transferred shall not exceed half of the total credits normally required under the degree curricula of the candidates during their candidature at the University.
- (e) Unless otherwise permitted by the Board of the Faculty, candidates shall be recommended for discontinuation of their studies if they have:
 - (i) failed to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters, or
 - (ii) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters (not including the summer semester), or
 - (iii) exceeded the maximum period of registration specified in the regulations of the degree.

UG 5 Requirements for graduation:

To be eligible for admission to the degree, candidates shall fulfill the following requirements in addition to the requirements prescribed in the regulations and syllabuses governing the degree curriculum within the maximum period of registration:

- (a) successful completion of 12 credits in English language enhancement, including 6 credits in Core University English² and 6 credits in an English in the Discipline course³;
- (b) successful completion of 6 credits in Chinese language enhancement⁴;
- (c) successful completion of 36 credits of courses in the Common Core Curriculum, comprising at least one and not more than two courses from each Area of Inquiry⁵ with not more than 24 credits of course being selected within one academic year except where candidates are required to make up for failed credits; and
- (d) successful completion of a capstone experience as specified in the syllabuses of the degree curriculum.

UG 6 Exemption:

Candidates may be exempted, with or without special conditions attached, from any of the

² Candidates who have achieved Level 5** in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent, may at the discretion of the Faculty be exempted from this requirement and should take an elective course in lieu, see *Regulation UG6*.

³ (a) To satisfy the English in the Discipline (ED) requirement, candidates who have passed the ED course for a Major but subsequently change that Major are required to pass the ED course for the new Major, or either of the double Majors finally declared upon graduation irrespective of whether the second Major is offered within or outside of the candidates' home Faculty.

⁽b) Candidates declaring double Majors can, if they fail in the ED course for one of the Majors, either (i) re-take and successfully complete that failed ED course, or (ii) successfully complete the ED course for the other Major, irrespective of whether the Major is offered within or outside of the candidates' home Faculty.

⁽c) Candidates who undertake studies in double Majors or double degrees are not required to take a second ED course but may be advised by the Faculty to do so.

⁴ Candidates who have not studied Chinese language during their secondary education may be exempted from this requirement and should take an elective course in lieu, see *Regulation UG6*.

⁵ Candidates registered for dual degree studies are required to successfully complete 24 credits of courses in the Common Core Curriculum, selecting one course from each Area of Inquiry, within the curriculum of the first degree, as appropriate.

requirements in UG 5 by the Senate in exceptional circumstances. Candidates who are so exempted must replace the number of exempted credits with courses of the same credit value.

UG7 Assessment:

- (a) Candidates shall be assessed for each of the courses for which they have registered, and assessment may be conducted in any combination of continuous assessment of coursework, written examinations and/or any other assessable activities. Only passed courses will earn credits.
- (b) Candidates who are unable, because of illness, to be present at the written examination of any course may apply for permission to present themselves at a supplementary examination of the same course to be held before the beginning of the First Semester of the following academic year. Any such application shall be made on the form prescribed within two weeks of the first day of the candidate's absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.
- (c) Candidates suspended under Statute XXXI shall not be allowed to take, present themselves for, and participate in any assessments during the period of suspension, unless otherwise permitted by the Senate.
- (d) Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.
- (e) Candidates are required to make up for failed courses in the following manner as prescribed in the curriculum regulations:
 - (i) undergoing re-assessment/re-examination in the failed course to be held no later than the end of the following semester (not including the summer semester); or
 - (ii) re-submitting failed coursework, without having to repeat the same course of instruction; or
 - (iii) repeating the failed course by undergoing instruction and satisfying the assessments; or
 - (iv) for elective courses, taking another course in lieu and satisfying the assessment requirements.
- (f) There shall be no appeal against the results of examinations and all other forms of assessment.

UG 8 Grading system:

(a) The grades, their standards and the grade points for assessment shall be as follows⁶:

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⁶ UG 8 is not applicable to the respective Professional Core of the BDS and MBBS curricula.

(b) Special permission may be given by Senate for courses in individual curricula to be graded as 'Pass', 'Fail' or 'Distinction'. Such courses will not be included in the calculation of the GPA.

UG9 Honours classifications:

(a) Honours classifications shall be awarded in five divisions⁷: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the degree in accordance with the following Graduate GPA scores, with all courses taken (including failed courses) carrying equal weighting which are proportionate to their credit values⁸:

Class of honours	GGPA range
First Class Honours	3.60 - 4.30
Second Class Honours	(2.40 - 3.59)
Division One	3.00 - 3.59
Division Two	2.40 - 2.99
Third Class Honours	1.70 - 2.39
Pass	1.00 - 1.69

- (b) Honours classification may not be determined solely on the basis of a candidate's Graduation GPA and the Board of Examiners for the degree may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Graduation GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.
- (c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

⁷ UG 9 is not applicable to the BChinMed, BDS and MBBS curricula.

⁸ For students in the 2017-18 intake and thereafter who have successfully completed six Common Core courses, the calculation of Graduation GPA is subject to the proviso that either five Common Core course with the highest grades (covering all four Areas of Inquiry), or all six courses will be counted towards Graduation GPA, depending on which generates the higher Graduation GPA.

REGULATIONS FOR FIRST DEGREE CURRICULA¹

Regulations for First Degree Curricula (for students admitted under the 4-year '2012 curriculum' to the first year in the academic years in 2014-15, 2015-16 and 2016-17, students admitted directed to the second year in the academic year 2017-18, and students admitted directed to the third year in the academic years 2016-17, 2017-18 and 2018-19)

(See also General Regulations)

UG 1 Definitions:

For the purpose of regulations and syllabuses for all first degree curricula unless otherwise defined —

An 'academic year' comprises two semesters, the first semester to commence in September and end in December, and the second semester to commence in January and end in May/June, on dates as prescribed by the Senate. It includes, normally at the end of each semester, a period during which candidates are assessed. For some curricula, a 'summer semester' may be organized in addition to the normal two semesters. Clinical curricula have extended semesters.

A 'summer semester' normally comprises seven to eight weeks of intensive timetabled teaching and assessment to commence four weeks after the end of the second semester assessment period, and to conclude about one week before the start of the next academic year.

The 'maximum period of registration' is equivalent to a period which is 150% of the curriculum's normative period of study as specified in the degree regulations, provided that where this results in a residual fraction of an academic year, the fractional period shall be extended to one full academic year.

'Degree curriculum' means the entire study requirements for the award of an undergraduate degree.

'Major programme' means the study requirements, including a capstone experience, for a single major area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 72 credits nor more than 96 credits, as prescribed in the syllabuses for a degree curriculum.

'Minor programme' means the study requirements for a single minor area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 36 credits nor more than 48 credits, as prescribed in the syllabuses for a degree curriculum.

'Professional core' refers to the study requirements, including a capstone experience, prescribed in the regulations and syllabuses for disciplinary studies in degree curricula which are not structured as major/minor programmes for reasons relating to professional qualification and/or accreditation.

These regulations are applicable to candidates admitted from 2016-17 onwards to the first year of first degree curricula under the 4-year '2012 curriculum', the 2-year curriculum in respect of the BSc(IM), the

⁵⁻year curriculum in respect of the BA&BEd(LangEd), BEd&BSc, BEd&BSocSc, BSc(Sp&HearSc), and BNurs, and the 6-year curriculum in respect of the BChinMed, BDS and MBBS. Reference in these regulations to the powers of the Boards of Faculties shall be applicable to Senate Boards of Studies which administer first degree curricula.

⁽The Regulations for First Degree Curricula applicable to cohorts admitted in 2012-13 and 2013-14 under the 4-year '2012 curriculum' can be found in the Calendar for 2013-14, and in the Calendar for 2014-15 for the cohorts admitted in 2014-15 and 2015-16.)

'Course' means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

'Disciplinary elective course' or 'Disciplinary Elective' means any course offered in the same major or minor programme or the professional core which can be taken by candidates to fulfill the curriculum requirements as specified in the syllabuses of the degree curriculum.

'Elective course' or 'Elective' means any course offered within the same or another curriculum, other than compulsory courses in the candidate's degree curriculum, that can be taken by the candidate in order to complete the credit requirements of the degree curriculum.

'Capstone experience' refers to one or more courses within the major programme or professional core which are approved by the Board of the Faculty for the purpose of integrating knowledge and skills acquired, and which are prescribed in the syllabuses of the degree curriculum.

'Syllabus' means courses taught by departments, centres, and schools, offered under a degree curriculum.

'Prerequisite' means a course or a group of courses which candidates must have completed successfully or a requirement which candidates must have fulfilled before being permitted to take the course in question.

'Corequisite' means a course which candidates must take in conjunction with the course in question.

'Credits' or 'credit-units' means the value assigned to each course to indicate its study load relative to the total study load under a degree curriculum. The study load refers to the hours of student learning activities and experiences, both within and outside the classroom, and includes contact hours and time spent on assessment tasks and examinations. Candidates who satisfactorily complete courses with a credit value earn the credits assigned to these courses.

'Grade Points' are standardized measurements of candidates' academic achievement in courses taken to satisfy the requirements of the degree curriculum and are expressed as a scale prescribed in these regulations.

'Grade Point Average' is a numerical measure of a candidate's academic achievement over a specified period of time. Each course attempted (including each failed course) is assigned a numerical value, with all courses carrying equal weighting. This numerical value is the product of grade points earned for the course and the credit value of that course. The 'Grade Point Average' is the sum of these numerical values divided by the total number of credits attempted:

$$GPA = \frac{\sum\limits_{i}^{\Sigma} Course\ Grade\ Point \times Course\ Credit\ Value}{\sum\limits_{i}^{\Sigma} Course\ Credit\ Value}$$

(where 'i' stands for all passed and failed courses taken by the student over a specified period)

'Semester Grade Point Average' or 'Semester GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) during a given semester.

'Year Grade Point Average' or 'Year GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) during a given academic year.

'Cumulative Grade Point Average' or 'Cumulative GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) at the time of calculation.

'Assessment' refers to judgment about the quality and extent to which a student has achieved the stated learning objectives or learning outcomes. It includes all types of assessment activities which allow for such a judgment to be made. For the purpose of interpreting the relevant provisions of the Ordinance and the Statutes and where appropriate,

reference to 'examination' or 'examinations' in the Ordinance and the Statutes shall include and cover all forms of 'assessment' and its related processes.

A 'transcript' refers to a transcript of the record of study of a candidate, issued by the Registry of the University.

UG 2 Advanced standing:

Advanced standing may be granted to candidates in recognition of studies completed successfully before admission to the curriculum. Candidates who are awarded Advanced Standing will not be granted any further credit transfer for those studies for which Advanced Standing has been granted. The amount of credits to be granted for advanced standing shall be determined by the Board of the Faculty, in accordance with the following principles:

- (a) at least half the number of credits of the degree curriculum normally required for award of the degree shall be accumulated through study at this University or from transfer of credits for courses completed at other institutions in accordance with Regulation UG 4(d); and
- (b) in accordance with Statute III.5 and notwithstanding the granting of advanced and/or transfer credits, a minimum of two semesters of study at this University shall be required before a candidate is considered for the award of a first degree, other than a degree in medicine or surgery, and a minimum of four semesters of study at this University shall be required before a candidate is considered for a first degree in medicine or surgery.

Credits granted for advanced standing shall not normally be included in the calculation of the GPA unless permitted by the Board of the Faculty but will be recorded on the transcript of the candidate.

UG 3 Period of study:

The period of study of the curriculum shall be specified in the regulations governing the degree. To be eligible for award of the degree, a candidate shall fulfill all curriculum requirements within the maximum period of registration, unless otherwise permitted or required by the Board of the Faculty.

UG 4 Progression in curriculum:

- (a) Candidates shall normally be required to take not fewer than 24 credits nor more than 30 credits in any one semester (except the summer semester) unless otherwise permitted or required by the Board of the Faculty, or except in the last semester of study when the number of outstanding credits required to complete the curriculum requirements is fewer than 24 credits.
- (b) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, and/or further credits during the summer semester, accumulating up to a maximum of 72 credits in one academic year. With the special permission of the Board of the Faculty, candidates may exceed the annual study load of 72 credits in a given academic year provided that the total number of credits taken does not exceed the maximum curriculum study load for the normative period of study specified in the curriculum regulations, save as provided for under UG4(c).
- (c) Where candidates are required to make up for failed credits, the Board of the Faculty may give permission for candidates to exceed the annual study load of 72 credits provided that the total number of credits taken does not exceed the maximum curriculum study load for the maximum period of registration specified in the curriculum regulations.
- (d) Candidates may, with the approval of the Board of the Faculty, transfer credits for courses completed at other institutions at any time during their candidature. The

number of transferred credits may be recorded in the transcript of the candidate, but the results of courses completed at other institutions shall not be included in the calculation of the GPA. The number of credits to be transferred shall not exceed half of the total credits normally required under the degree curricula of the candidates during their candidature at the University.

- (e) Unless otherwise permitted by the Board of the Faculty, candidates shall be recommended for discontinuation of their studies if they have:
 - (i) failed to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters, or
 - (ii) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters (not including the summer semester), or
 - (iii) exceeded the maximum period of registration specified in the regulations of the degree.

UG 5 Requirements for graduation:

To be eligible for admission to the degree, candidates shall fulfill the following requirements in addition to the requirements prescribed in the regulations and syllabuses governing the degree curriculum within the maximum period of registration:

- (a) successful completion of 12 credits in English language enhancement, including 6 credits in Core University English² and 6 credits in an English in the Discipline course³;
- (b) successful completion of 6 credits in Chinese language enhancement⁴;
- (c) successful completion of 36 credits of courses in the Common Core Curriculum, comprising at least one and not more than two courses from each Area of Inquiry⁵ with not more than 24 credits of course being selected within one academic year except where candidates are required to make up for failed credits; and
- (d) successful completion of a capstone experience as specified in the syllabuses of the degree curriculum.

UG 6 Exemption:

Candidates may be exempted, with or without special conditions attached, from any of the

² Candidates who have achieved Level 5** in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent, may at the discretion of the Faculty be exempted from this requirement and should take an elective course in lieu, see *Regulation UG6*.

- 3 (a) To satisfy the English in the Discipline (ED) requirement, candidates who have passed the ED course for a Major but subsequently change that Major are required to pass the ED course for the new Major, or either of the double Majors finally declared upon graduation irrespective of whether the second Major is offered within or outside of the candidates' home Faculty.
 - (b) Candidates declaring double Majors can, if they fail in the ED course for one of the Majors, either (i) re-take and successfully complete that failed ED course, or (ii) successfully complete the ED course for the other Major, irrespective of whether the Major is offered within or outside of the candidates' home Faculty.
- (c) Candidates who undertake studies in double Majors or double degrees are not required to take a second ED course but may be advised by the Faculty to do so.

⁴ Candidates who have not studied Chinese language during their secondary education may be exempted from this requirement and should take an elective course in lieu, see *Regulation UG6*.

⁵ Candidates registered for double degree studies are required to successfully complete 24 credits of courses in the Common Core Curriculum, selecting one course from each Area of Inquiry, within the curriculum of the first degree, as appropriate.

requirements in UG 5 by the Senate in exceptional circumstances. Candidates who are so exempted must replace the number of exempted credits with courses of the same credit value.

UG7 Assessment:

- (a) Candidates shall be assessed for each of the courses for which they have registered, and assessment may be conducted in any combination of continuous assessment of coursework, written examinations and/or any other assessable activities. Only passed courses will earn credits.
- (b) Candidates who are unable, because of illness, to be present at the written examination of any course may apply for permission to present themselves at a supplementary examination of the same course to be held before the beginning of the First Semester of the following academic year. Any such application shall be made on the form prescribed within two weeks of the first day of the candidate's absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.
- (c) Candidates suspended under Statute XXXI shall not be allowed to take, present themselves for, and participate in any assessments during the period of suspension, unless otherwise permitted by the Senate.
- (d) Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.
- (e) Candidates are required to make up for failed courses in the following manner as prescribed in the curriculum regulations:
 - (i) undergoing re-assessment/re-examination in the failed course to be held no later than the end of the following semester (not including the summer semester); or
 - (ii) re-submitting failed coursework, without having to repeat the same course of instruction; or
 - (iii) repeating the failed course by undergoing instruction and satisfying the assessments; or
 - (iv) for elective courses, taking another course in lieu and satisfying the assessment requirements.
- (f) There shall be no appeal against the results of examinations and all other forms of assessment.

UG 8 Grading system:

(a) The grades, their standards and the grade points for assessment shall be as follows⁶:

Grade		Standard	Grade Point
A+	1		4.3
A	}	Excellent	4.0
A-	J		3.7
B+	1		3.3
В	}	Good	3.0
B-	J		2.7
C+)		2.3
C	}	Satisfactory	2.0
C-	J		1.7
D+	l	Pass	1.3
D	ſ	rass	1.0
F		Fail	0

⁶ UG 8 is not applicable to the respective Professional Core of the BDS and MBBS curricula.

(b) Special permission may be given by Senate for courses in individual curricula to be graded as 'Pass', 'Fail' or 'Distinction'. Such courses will not be included in the calculation of the GPA.

UG9 Honours classifications:

(a) Honours classifications shall be awarded in five divisions⁷: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the degree in accordance with the following Cumulative GPA scores, with all courses taken (including failed courses) carrying equal weighting:

Class of honours	CGPA range
First Class Honours	3.60 - 4.30
Second Class Honours	(2.40 - 3.59)
Division One	3.00 - 3.59
Division Two	2.40 - 2.99
Third Class Honours	1.70 - 2.39
Pass	1.00 - 1.69

- (b) Honours classification may not be determined solely on the basis of a candidate's Cumulative GPA and the Board of Examiners for the degree may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Cumulative GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.
- (c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

⁷ UG 9 is not applicable to the BChinMed, BDS and MBBS curricula.

REGULATIONS FOR FIRST DEGREE CURRICULA

Regulations for First Degree Curricula (for students admitted under the 4-year '2012 curriculum' to the first year in the academic years 2012-13 and 2013-14, and students admitted directly to the third year in 2014-15 and 2015-16)

(See also General Regulations)

UG 1 Definitions:

For the purpose of regulations and syllabuses for all first degree curricula unless otherwise defined —

An 'academic year' comprises two semesters, the first semester to commence in September and end in December, and the second semester to commence in January and end in May/June, on dates as prescribed by the Senate. It includes, normally at the end of each semester, a period during which candidates are assessed. For some curricula, a 'summer semester' may be organized in addition to the normal two semesters. Clinical curricula have extended semesters.

A 'summer semester' normally comprises seven to eight weeks of intensive timetabled teaching and assessment to commence four weeks after the end of the second semester assessment period, and to conclude about one week before the start of the next academic year.

The 'maximum period of registration' is equivalent to a period which is 150% of the curriculum's normative period of study as specified in the degree regulations, provided that where this results in a residual fraction of an academic year, the fractional period shall be extended to one full academic year.

'Degree curriculum' means the entire study requirements for the award of an undergraduate degree.

'Major programme' means the study requirements, including a capstone experience, for a single major area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 72 credits nor more than 96 credits, as prescribed in the syllabuses for a degree curriculum.

'Minor programme' means the study requirements for a single minor area of disciplinary, interdisciplinary or multidisciplinary study, accumulating not fewer than 36 credits nor more than 48 credits, as prescribed in the syllabuses for a degree curriculum.

'Professional core' refers to the study requirements, including a capstone experience, prescribed in the regulations and syllabuses for disciplinary studies in degree curricula which are not structured as major/minor programmes for reasons relating to professional qualification and/or accreditation.

¹ These regulations are applicable to candidates admitted from 2016-17 onwards to the first year of first degree curricula under the 4-year '2012 curriculum', the 2-year curriculum in respect of the BSc(IM), the 5-year curriculum in respect of the BA&BEd(LangEd), BEd&BSc, BEd&BSocSc, BSc(Sp&HearSc), and BNurs, and the 6-year curriculum in respect of the BChinMed, BDS and MBBS. Reference in these regulations to the powers of the Boards of Faculties shall be applicable to Senate Boards of Studies which

administer first degree curricula.

⁽The Regulations for First Degree Curricula applicable to cohorts admitted in 2012-13 and 2013-14 under the 4-year '2012 curriculum' can be found in the Calendar for 2013-14, and in the Calendar for 2014-15 for the cohorts admitted in 2014-15 and 2015-16.)

'Course' means a course of study, with a credit value expressed as a number of credit-units as specified in the syllabuses for a degree curriculum.

'Disciplinary elective course' or 'Disciplinary Elective' means any course offered in the same major or minor programme or the professional core which can be taken by candidates to fulfill the curriculum requirements as specified in the syllabuses of the degree curriculum.

'Elective course' or 'Elective' means any course offered within the same or another curriculum, other than compulsory courses in the candidate's degree curriculum, that can be taken by the candidate in order to complete the credit requirements of the degree curriculum.

'Capstone experience' refers to one or more courses within the major programme or professional core which are approved by the Board of the Faculty for the purpose of integrating knowledge and skills acquired, and which are prescribed in the syllabuses of the degree curriculum.

'Syllabus' means courses taught by departments, centres, and schools, offered under a degree curriculum.

'Prerequisite' means a course or a group of courses which candidates must have completed successfully or a requirement which candidates must have fulfilled before being permitted to take the course in question.

'Corequisite' means a course which candidates must take in conjunction with the course in question.

'Credits' or 'credit-units' means the value assigned to each course to indicate its study load relative to the total study load under a degree curriculum. The study load refers to the hours of student learning activities and experiences, both within and outside the classroom, and includes contact hours and time spent on assessment tasks and examinations. Candidates who satisfactorily complete courses with a credit value earn the credits assigned to these courses.

'Grade Points' are standardized measurements of candidates' academic achievement in courses taken to satisfy the requirements of the degree curriculum and are expressed as a scale prescribed in these regulations.

'Grade Point Average' is a numerical measure of a candidate's academic achievement over a specified period of time. Each course attempted (including each failed course) is assigned a numerical value, with all courses carrying equal weighting. This numerical value is the product of grade points earned for the course and the credit value of that course. The 'Grade Point Average' is the sum of these numerical values divided by the total number of credits attempted:

$$GPA = \frac{\sum\limits_{i}^{\Sigma} Course\ Grade\ Point \times Course\ Credit\ Value}{\sum\limits_{i}^{\Sigma} Course\ Credit\ Value}$$

(where 'i' stands for all passed and failed courses taken by the student over a specified period)

'Semester Grade Point Average' or 'Semester GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) during a given semester.

'Year Grade Point Average' or 'Year GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) during a given academic year.

'Cumulative Grade Point Average' or 'Cumulative GPA' is the GPA in respect of courses attempted by a candidate (including failed courses) at the time of calculation.

'Assessment' refers to judgment about the quality and extent to which a student has achieved the stated learning objectives or learning outcomes. It includes all types of assessment activities which allow for such a judgment to be made. For the purpose of interpreting the relevant provisions of the Ordinance and the Statutes and where appropriate,

reference to 'examination' or 'examinations' in the Ordinance and the Statutes shall include and cover all forms of 'assessment' and its related processes.

A 'transcript' refers to a transcript of the record of study of a candidate, issued by the Registry of the University.

UG 2 Advanced standing:

Advanced standing may be granted to candidates in recognition of studies completed successfully in an approved institution of higher education elsewhere. Candidates who are awarded Advanced Standing will not be granted any further credit transfer for those studies for which Advanced Standing has been granted. The amount of credits to be granted for advanced standing shall be determined by the Board of the Faculty, in accordance with the following principles:

- (a) at least half the number of credits of the degree curriculum normally required for award of the degree shall be accumulated through study at this University or from transfer of credits for courses completed at other institutions in accordance with Regulation UG 4(d); and
- (b) in accordance with Statute III.5 and notwithstanding the granting of advanced and/or transfer credits, a minimum of two semesters of study at this University shall be required before a candidate is considered for the award of a first degree, other than a degree in medicine or surgery, and a minimum of four semesters of study at this University shall be required before a candidate is considered for a first degree in medicine or surgery.

Credits granted for advanced standing shall not normally be included in the calculation of the GPA unless permitted by the Board of the Faculty but will be recorded on the transcript of the candidate.

UG 3 Period of study:

The period of study of the curriculum shall be specified in the regulations governing the degree. To be eligible for award of the degree, a candidate shall fulfill all curriculum requirements within the maximum period of registration, unless otherwise permitted or required by the Board of the Faculty.

UG 4 Progression in curriculum:

- (a) Candidates shall normally be required to take not fewer than 24 credits nor more than 30 credits in any one semester (except the summer semester) unless otherwise permitted or required by the Board of the Faculty, or except in the last semester of study when the number of outstanding credits required to complete the curriculum requirements is fewer than 24 credits.
- (b) Candidates may, of their own volition, take additional credits not exceeding 6 credits in each semester, and/or further credits during the summer semester, accumulating up to a maximum of 72 credits in one academic year. With the special permission of the Board of the Faculty, candidates may exceed the annual study load of 72 credits in a given academic year provided that the total number of credits taken does not exceed the maximum curriculum study load for the normative period of study specified in the curriculum regulations, save as provided for under UG4(c).
- (c) Where candidates are required to make up for failed credits, the Board of the Faculty may give permission for candidates to exceed the annual study load of 72 credits provided that the total number of credits taken does not exceed the maximum curriculum study load for the maximum period of registration specified in the curriculum regulations.

- (d) Candidates may, with the approval of the Board of the Faculty, transfer credits for courses completed at other institutions at any time during their candidature. The number of transferred credits may be recorded in the transcript of the candidate, but the results of courses completed at other institutions shall not be included in the calculation of the GPA. The number of credits to be transferred shall not exceed half of the total credits normally required under the degree curricula of the candidates during their candidature at the University.
- (e) Unless otherwise permitted by the Board of the Faculty, candidates shall be recommended for discontinuation of their studies if they have:
 - (i) failed to complete successfully 36 or more credits in two consecutive semesters (not including the summer semester), except where they are not required to take such a number of credits in the two given semesters, or
 - (ii) failed to achieve an average Semester GPA of 1.0 or higher for two consecutive semesters (not including the summer semester), or
 - (iii) exceeded the maximum period of registration specified in the regulations of the degree.

UG 5 Requirements for graduation:

To be eligible for admission to the degree, candidates shall fulfill the following requirements in addition to the requirements prescribed in the regulations and syllabuses governing the degree curriculum within the maximum period of registration:

- (a) successful completion of 12 credits in English language enhancement, including 6 credits in Core University English² and 6 credits in an English in the Discipline course³;
- (b) successful completion of 6 credits in Chinese language enhancement⁴;
- (c) successful completion of 36 credits of courses in the Common Core Curriculum, comprising at least one and not more than two courses from each Area of Inquiry⁵ with not more than 24 credits of courses being selected within one academic year except where candidates are required to make up for failed credits; and
- (d) successful completion of a capstone experience as specified in the syllabuses of the degree curriculum.

3 (a) To satisfy the English in the Discipline (ED) requirement, candidates who have passed the ED course for a Major but subsequently change that Major are required to pass the ED course for the new Major, or either of the double Majors finally declared upon graduation irrespective of whether the second Major is offered within or outside of the candidates' home Faculty.

- (b) Candidates declaring double Majors can, if they fail in the ED course for one of the Majors, either (i) re-take and successfully complete that failed ED course, or (ii) successfully complete the ED course for the other Major, irrespective of whether the Major is offered within or outside of the candidates' home Faculty.
- (c) Candidates who undertake studies in double Majors or double degrees are not required to take a second ED course but may be advised by the Faculty to do so.

² Candidates who have achieved Level 5** in English Language in the Hong Kong Diploma of Secondary Education Examination, or equivalent, may at the discretion of the Faculty be exempted from this requirement and should take an elective course in lieu, see *Regulation UG6*.

⁴ Candidates who have not studied Chinese language during their secondary education may be exempted from this requirement and should take an elective course in lieu, see *Regulation UG6*.

⁵ Candidates registered for double degree studies are required to successfully complete 24 credits of courses in the Common Core Curriculum, selecting one course from each Area of Inquiry, within the curriculum of the first degree, as appropriate.

UG 6 Exemption:

Candidates may be exempted, with or without special conditions attached, from any of the requirements in UG 5 by the Senate in exceptional circumstances. Candidates who are so exempted must replace the number of exempted credits with courses of the same credit value.

UG7 Assessment:

- (a) Candidates shall be assessed for each of the courses for which they have registered, and assessment may be conducted in any combination of continuous assessment of coursework, written examinations and/or any other assessable activities. Only passed courses will earn credits.
- (b) Candidates who are unable, because of illness, to be present at the written examination of any course may apply for permission to present themselves at a supplementary examination of the same course to be held before the beginning of the First Semester of the following academic year. Any such application shall be made on the form prescribed within two weeks of the first day of the candidate's absence from any examination. Any supplementary examination shall be part of that academic year's examinations, and the provisions made in the regulations for failure at the first attempt shall apply accordingly.
- (c) Candidates shall not be permitted to repeat a course for which they have received a D grade or above for the purpose of upgrading.
- (d) Candidates are required to make up for failed courses in the following manner as prescribed in the curriculum regulations:
 - (i) undergoing re-assessment/re-examination in the failed course to be held no later than the end of the following semester (not including the summer semester); or
 - (ii) re-submitting failed coursework, without having to repeat the same course of instruction; or
 - (iii) repeating the failed course by undergoing instruction and satisfying the assessments; or
 - (iv) for elective courses, taking another course in lieu and satisfying the assessment requirements.
- (e) There shall be no appeal against the results of examinations and all other forms of assessment.

UG 8 Grading system:

(a) The grades, their standards and the grade points for assessment shall be as follows⁶:

Grade		Standard	Grade Point
A+	1		4.3
A	}	Excellent	4.0
A-	J		3.7
B+	1		3.3
В	}	Good	3.0
B-	J		2.7
C+	1		2.3
C	}	Satisfactory	2.0
C-	J	•	1.7
D+	l	Pass	1.3
D	ſ	Pass	1.0
F		Fail	0

⁶ UG 8 is not applicable to the respective Professional Core of the BDS and MBBS curricula.

(b) Special permission may be given by Senate for courses in individual curricula to be graded as 'Pass', 'Fail' or 'Distinction'. Such courses will not be included in the calculation of the GPA.

UG9 Honours classifications:

(a) Honours classifications shall be awarded in five divisions⁷: First Class Honours, Second Class Honours Division One, Second Class Honours Division Two, Third Class Honours, and Pass. The classification of honours shall be determined by the Board of Examiners for the degree in accordance with the following Cumulative GPA scores, with all courses taken (including failed courses) carrying equal weighting:

Class of honours	CGPA range
First Class Honours	3.60 - 4.30
Second Class Honours	(2.40 - 3.59)
Division One	3.00 - 3.59
Division Two	2.40 - 2.99
Third Class Honours	1.70 - 2.39
Pass	1.00 - 1.69

- (b) Honours classification may not be determined solely on the basis of a candidate's Cumulative GPA and the Board of Examiners for the degree may, at its absolute discretion and with justification, award a higher class of honours to a candidate deemed to have demonstrated meritorious academic achievement but whose Cumulative GPA falls below the range stipulated in UG9(a) of the higher classification by not more than 0.1 Grade Point.
- (c) A list of candidates who have successfully completed all degree requirements shall be posted on Faculty noticeboards.

⁷ UG 9 is not applicable to the BChinMed, BDS and MBBS curricula.

Teaching Weeks

SCIENCE

Teaching Weeks 2020-21 for Undergraduate and Taught Postgraduate Students

	SUN	MON	TUE	WED	THUR	FRI	SAT	FIRST SEMESTER: SEP 1 - DEC 23, 2020	Week
		Ī	1	2	3	4	5	First Day of Teaching: Sep 1, 2020	1
	6	7	8	9	10	11	12		2
SEP-20	13	14	15	16	17	18	19		3
	20	21	22	23	24	25	26		4
	27	28	29	30					5
					[1]	[2]	3	1	
	4	5	6	7	8	9	10		6
OCT-20	11	12	13	14	15	16	17	Reading/ Field Trip Week: Oct 12 - 17, 2020	7(Reading)
	18	19	20	21	22	23	24		8
	25	[26]	27	28	29	30	31		9
	1	2	3	4	5	6	7		10
NOTE OF	8	9	10	11	12	13	14		11
NOV-20	15	16	17 24	18 25	19 26	20 27	21 28		12
	22 29	23	24	25	20	21	28	L+ D	13
	29	30	1	2	3	4	5	Last Day of Teaching: Nov 30, 2020 Revision Period: Dec 1 - 7, 2020	14(Revision)
	6	7	8	9	10	11	12	Assessment Period: Dec 8 - 23, 2020	14(Kevision)
DEC-20	13	14	15	16	17	18	19	Assessment Feriod. Dec 8 - 23, 2020	2
DEC-20	20	21	22	23	(24)	[25]	[26]		3
	27	28	29	30	9	[23]	[20]		Break
	21	20	29	30	<31>	[1]	2	1	ыеак
	3	4	5	6	7	8	9		Break
	10	11	12	13	14	15	16	SECOND SEMESTER: JAN 18 - MAY 29, 2021	Break
JAN-21	17	18	19	20	21	22	23	First Day of Teaching: Jan 18, 2021	1
	24	25	26	27	28	29	30	That Buy of Tedening. July 10, 2021	2
	31	23	20	21	20	2)	30		2
	31	1	2	3	4	5	6	Class Suspension Period for the Lunar New Year:	3
	7	8	9	10	<11>	[12]	[13]	Feb 12 - 18, 2021	4
FEB-21	14	[15]	16	(17)	$\overline{(18)}$	19	20	100 12 10, 2021	•
	21	22	23	24	25	26	27		5
	28								
		1	2	3	4	5	6		6
	7	8	9	10	11	12	13	Reading/ Field Trip Week: Mar 8 - 13, 2021	7(Reading)
MAR-21	14	15	(16)	17	18	19	20		8
	21	22	23	24	25	26	27		9
	28	29	30	31					10
					1	[2]	[3]		
	4	[5]	[6]	7	8	9	10		11
APR-21	11	12	13	14	15	16	17		12
	18	19	20	21	22	23	24		13
	25	26	27	28	29	30	F13	Last Day of Teaching: Apr 30, 2021	14
	2	3	4	5	6	7	[1] 8	Revision Period: May 3 - 8, 2021	15 (Di-i)
	9	10	11	12	13	14	15	Assessment Period: May 3 - 8, 2021	15(Revision) 1
MAY-21	16	17	18	[19]	20	21	22	Assessment Period. May 10 - 29, 2021	2
	23	24	25	26	27	28	29	Way 10 - 29, 2021	3
	30	31	23	20	21	20	49		3
	50	31	1	2	3	4	5	1	Break
	6	7	8	9	10	11	12		Break
JUN-21	13	[14]	15	16	17	18	19		Break
001121	20	21	22	23	24	25	26	OPTIONAL SUMMER SEMESTER	Break
	27	28	29	30				JUN 28 - AUG 21, 2021	1
					[1]	2	3		
	4	5	6	7	8	9	10		2
JUL-21	11	12	13	14	15	16	17		3
	18	19	20	21	22	23	24		4
	25	26	27	28	29	30	31		5
	1	2	3	4	5	6	7		6
	8	9	10	11	12	13	14		7
AUG-21	15	16	17	18	19	20	21		8
	22	23	24	25	26	27	28		
	29	30	31						
[] General Holiday Reading/ Field Trip Week									
() University Holiday (Full Day) Revision Period									
(
<> University	y Holiday (afternoon or	nly)		Class Susp	ension Pe	eriod for the	Lunar New Year	
				_		. D			
					Assessmer	t Period			

Notes:

First Semester: 11 Mondays, 12 Tuesdays and Wednesdays, 11 Thursdays and Fridays, 12 Saturdays Second Semester: 12 Mondays, 11 Tuesdays, 13 Wednesdays, 12.5 Thursdays, 12 Fridays, 11 Saturdays

Useful contacts and websites

SCIENCE

Useful contacts and websites

Faculty of Science Office Location: Ground Floor,

Chong Yuet Ming Physics Building

Tel : 3917 2683
Fax : 2858 4620
Email : science@hku.hk

Website : https://www.scifac.hku.hk/

(Please visit https://www.scifac.hku.hk/ for the latest updates of BSc courses, timetables, notices and forms)

Departments/Schools

Biological Sciences Website : https://www.biosch.hku.hk/
Biomedical Sciences Website : http://www.sbms.hku.hk/
Chemistry Website : https://www.chemistry.hku.hk/
Earth Sciences Website : https://www.earthsciences.hku.hk/
Mathematics Website : https://hkumath.hku.hk/web/index.php

Physics Website : https://www.physics.hku.hk/
Statistics and Actuarial Science Website : https://saasweb.hku.hk/

Academic Advising Office Tel : 3917 0128

Website : http://aao.hku.hk

Academic Services Office Office Location : G04, Run Run Shaw Building

Tel : 2859 2433
Fax : 2540 1405
Email : asoffice@hku.hk

Website : http://www.ase.hku.hk

Common Core courses Website : https://commoncore.hku.hk/

HKU Worldwide Undergraduate

Exchange Programme

Website : https://aal.hku.hk/studyabroad/

Centre of Development and Tel : 3917 2305

Resources for Students (CEDARS) Website : https://www.cedars.hku.hk/

University Health Service Tel : 3917 2501 (General enquiries)

2549 4686 (Medical appointments only)

Website : http://www.uhs.hku.hk

Plagiarism Website : https://tl.hku.hk/plagiarism/