BS_C

Syllabuses and Regulations (4-year curriculum)

2015-16

Faculty of ScienceThe University of Hong Kong

General Information

SCIENCE

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

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1. A BSc Degree Curriculum

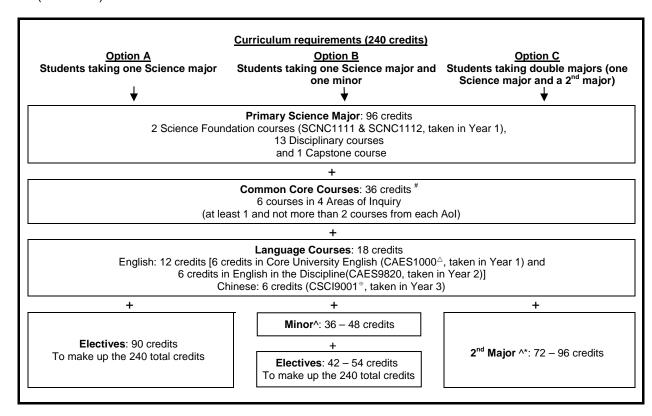
The Faculty of Science offers a number of Science majors leading to the award of a BSc degree.

All students admitted to the 6901 BSc programme under the 4-year curriculum are required to complete at least one Science major out of the 16 Science majors as the 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 '2012 curriculum' in 2012-13 or thereafter

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:

- 16 courses for the Science major including 2 Science Foundation courses, Disciplinary courses and capstone courses (96 credits)
- 2 English courses and 1 Chinese course for university language requirements (18 credits)
- 6 common core courses in 4 Areas of Inquiry (36 credits)
- A choice of 15 courses as elective courses, or to fulfill the requirements of a minor or a second major (90 credits)



Notes:

- # Student must select not more than one course from the same Area of Inquiry within one academic year and at least one and not more than two courses from each Area of Inquiry during the whole period of study. Common Core courses should be completed normally within the first three years of study.
- Students who have been admitted to Year 1 in 2015-16 and have achieved the following qualifications shall be exempted from taking CAES1000 Core University English and should take a 6-credit elective course in lieu:

5** on the HKDSE English Language Paper

tested by CAES to be of a native English speaker standard

holder of Bachelor's degree from an English-medium university

achieved an overall IELTS score of no less than a 7.5 and no less than a 7 on the Reading, Speaking, Listening and Writing Tests

achieved an overall TOEFL Internet Based Test score of no less than 102 and no less than 27 on the writing and speaking sections and no less than 24 on the listening and reading sections

achieved a level of no less than 5 in the HL English Language A: Literature or English Language A: Language and Literature paper or no less than 6 in the SL English Language A: Literature or English Language A: Language and Literature paper in the International Baccalaureate Diploma

achieved a Scholastic Aptitude Test (SAT) essay score of no less than 10 and no less than 700 on the Critical Reading and Writing Tests

achieved a score of no less than 5 on the Advanced Placement English Language and Composition Test or the Literature and Composition Test

achieved an A* in the English Language, English Literature or English Language and Literature GCE English A level paper (including specification A or B, if given)

Exempted students will not be able to enroll CAES1000 via Self Service enrollment.

- [‡] 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 Faculty Office to apply
 - (i) to take a 6-credit Cantonese or Putonghua language course offered by the School of Chinese especially for international and exchange students; OR
 - (ii) to be exempted from the Chinese language requirement. If exempted, students should 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, selecting not more than one course from the same Area of Inquiry within one academic year and at least one and not more than two courses from each Area of Inquiry during the whole period of study. Common Core courses should be completed normally within the first three years of the BSc study.

2. BSc Graduation Requirements and Honours Classification (for students admitted under the 4-year '2012 curriculum' in 2012-13 or thereafter)

(a) Award of a BSc degree

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 English (i.e. CAES1000) and 6 credits in an English in the Discipline course (i.e. CAES9820 Academic English for Science Students);
 - (b) 6 credits in Chinese language enhancement³ (i.e. CSCI9001 Practical Chinese for Science Students):

(c) For 2012 & 2013 cohorts:

36 credits of courses in the Common Core Curriculum, selecting not more than one course from the same Area of Inquiry within one academic year and at least one and not more than two courses from each Area of Inquiry during the whole period of study; and

For 2014 cohorts or thereafter:

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 one course from the same Area of Inquiry 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.

(b) Honours Classification

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

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

5** on the HKDSE English Language Paper

tested by CAES to be of a native English speaker standard

holder of Bachelor's degree from an English-medium university

achieved an overall IELTS score of no less than a 7.5 and no less than a 7 on the Reading, Speaking, Listening and Writing Tests

achieved an overall TOEFL Internet Based Test score of no less than 102 and no less than 27 on the writing and speaking sections and no less than 24 on the listening and reading sections

achieved a level of no less than 5 in the HL English Language A: Literature or English Language A: Language and Literature paper or no less than 6 in the SL English Language A: Literature or English Language A: Language and Literature paper in the International Baccalaureate Diploma

achieved a Scholastic Aptitude Test (SAT) essay score of no less than 10 and no less than 700 on the Critical Reading and Writing Tests

achieved a score of no less than 5 on the Advanced Placement English Language and Composition Test or the Literature and Composition Test

achieved an A* in the English Language, English Literature or English Language and Literature GCE English A level paper (including specification A or B, if given)

Exempted students will not be able to enroll CAES1000 via Self Service enrollment.

- 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.

¹ Candidates with the following qualifications shall be exempted from this requirement and should take a 6-credit elective course in lieu, see *Regulation UG6*:

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 Requirements for

Science Students

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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)				
	Biological Sciences	 BIOL3994 Directed studies in biological sciences (6) BIOL4964 Biological sciences internship (6) BIOL4994 Biological sciences project (12) 				
3.	Chemistry	 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) 				
4.	Earth System Science	1. EASC4911 Earth system: contemporary issues (6)				
5.	Ecology & Biodiversity	 BIOL3951 Ecology & biodiversity field course (6) BIOL3991 Directed studies in ecology & biodiversity (6) BIOL4911 Conservation science in practice (6) BIOL4991 Ecology & biodiversity project (12) 				
6.	Environmental Science	1. ENVS3999 Directed studies in environmental science (6) 2. ENVS4955 Environmental science in practice (6) 3. ENVS4966 Environmental science internship (6) 4. ENVS4999 Environmental science project (12)				
7.	Food & Nutritional Science	 BIOL3992 Directed studies in food & nutritional science (6) BIOL4912 Sensory evaluation of food (6) BIOL4962 Food & nutritional science internship (6) BIOL4992 Food & nutritional science project (12) 				
8.	Geology	1. EASC4955 Integrated field studies (6)				
9.	Mathematics	 MATH3999 Directed studies in mathematics (6) MATH4910 Senior mathematics seminar (6) MATH4911 Mathematics capstone project (6) MATH4966 Mathematics internship (6) MATH4999 Mathematics project (12) 				
10.	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)				
11.	Molecular Biology & Biotechnology	 BIOL3993 Directed studies in molecular biology & biotechnology (6) BIOL4963 Molecular biology & biotechnology internship (6) BIOL4993 Molecular biology & biotechnology project (12) 				
13.	Astronomy Physics	1. PHYS3999 Directed studies in physics (6) 2. PHYS4966 Physics internship (6) 3. PHYS4999 Physics project (12)				
15.	Decision Analytics Risk Management Statistics	1. STAT3799 Directed studies in statistics (6) 2. STAT4710 Capstone experience for statistics undergraduates (6) 3. STAT4766 Statistics internship (6) 4. STAT4799 Statistics project (12)				

Credit Unit Statement of

BSc Degree Curriculum

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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 16 Science Majors and 16 Science Minors are as follows:

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

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

Equivalency of HKDSE and

other qualifications

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SECTION IV Equivalency of HKDSE and other qualifications

Table of Equivalence between HKDSE and Other Qualifications

HYDGE	Grade	Equivalent Qualification to HKDSE				
HKDSE		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 fulfillment of all
Mathematics	2 or above	Mathematics (SL)/Mathematical Studies (SL)	Mathematics (AL)	Mathematics Level 1 or 2		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 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 on offer in 2015-16

SCIENCE

SECTION V Science Majors on offer in 2015/16

Majors offered by Science Faculty

Majors (16)

Statistics

Astronomy
Biochemistry
Biological Sciences
Chemistry
Decision Analytics
Earth System Science
Ecology & Biodiversity
Environmental Science
Food & Nutritional Science
Geology
Mathematics
Mathematics/Physics
Molecular Biology & Biotechnology
Physics
Risk Management

Major Title Major in Astronomy

Offered to students admitted to Year 1 in

2015

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 Combination:

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 Modern 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 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)

PHYS4654 General relativity (6)

PHYS4750 Experimental physics (6)

PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)

PHYS7450 Graduate electromagnetism (6)

PHYS7550 Graduate statistical mechanics (6)

PHYS7551 Solid state physics (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:

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 Astronomy

Offered to students admitted to Year 1 in

2014

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 Combination:

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 Modern 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

PHYS3850

PHYS3150 Theoretical physics (6)
PHYS3350 Classical mechanics (6)

PHYS3351 Quantum mechanics (6)

PHYS3450 Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

Waves and optics (6)

PHYS3551 Introductory solid state physics (6)

PHYS3750 Laser and spectroscopy (6)
PHYS3751 Physics of nanomaterials (6)

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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)

PHYS4654 General relativity (6)

PHYS4750 Experimental physics (6)

PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)

PHYS7450 Graduate electromagnetism (6)

PHYS7550 Graduate statistical mechanics (6)

PHYS7551 Solid state physics (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:

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 Astronomy

Offered to students admitted to Year 1 in

2013

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 Combination:

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 Modern 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 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)

PHYS4654 General relativity (6)

PHYS4750 Experimental physics (6)

PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)

PHYS7450 Graduate electromagnetism (6)

PHYS7550 Graduate statistical mechanics (6)

PHYS7551 Solid state physics (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:

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 Astronomy

Offered to students admitted to Year 1 in

2012

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 Combination:

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 Modern 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 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)

PHYS4654 General relativity (6)

PHYS4750 Experimental physics (6)

PHYS7350 Graduate classical mechanics (6)
PHYS7351 Graduate quantum mechanics (6)

PHYS7450 Graduate electromagnetism (6)

PHYS7550 Graduate statistical mechanics (6)

PHYS7551 Solid state physics (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:

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 Biochemistry

Offered to students admitted to Year 1 in

2015

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 Combination:

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)

CHEM2441 Organic chemistry I (6)

Disciplinary Electives (6 credits)

BIOC1600 Perspectives in biochemistry (6)

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

BIOL1110 From molecules to cells (6)

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

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:

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 Biochemistry

Offered to students admitted to Year 1 in

2014

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 Combination:

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)

Take either CHEM1043 or CHEM2541 to fulfill this 6

cerdits requirement, but not both.

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

CHEM2541 Introductory physical chemistry (6)

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.

- 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:

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 Biochemistry

Offered to students admitted to Year 1 in

2013

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 Combination:

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)

Take either CHEM1043 or CHEM2541 to fulfill this 6

cerdits requirement, but not both.

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

CHEM2541 Introductory physical chemistry (6)

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.

- 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 Biochemistry

Offered to students admitted to Year 1 in

2012

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 Combination:

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)

Take either CHEM1043 or CHEM2541 to fulfill this 6

cerdits requirement, but not both.

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

CHEM2541 Introductory physical chemistry (6)

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.

- 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 admitted to Year 1 in

2015

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 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 Combination:

NIL

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)
BIOL1111	Introductory microbiology (6)
BIOL1309	Evolutionary diversity (6)
BIOL2102	Biostatistics (6)
BIOL2103	Biological sciences laboratory course (6)
BIOL2306	Ecology and evolution (6)

2. Advanced level courses (at least 42 credits)

Disciplinary Electives (42 credits)

Students must select at least 1 course 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

BIOL3105 Animal physiology and environmental adaptation (6)

BIOL3107 Plant physiology (6)

BIOL3108 Microbial physiology (6)

BIOL3205 Human physiology (6)

(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 ecology (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. BIOL1111 Introductory Microbiology is not offered from 2015-16. Students should take BIOL2220 Principles of Biochemistry as a replacement.

- 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 admitted to Year 1 in

2014

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 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 Combination:

NIL

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)
BIOL1111	Introductory microbiology (6)
BIOL1309	Evolutionary diversity (6)
BIOL2102	Biostatistics (6)
BIOL2103	Biological sciences laboratory course (6)
BIOL2306	Ecology and evolution (6)

2. Advanced level courses (at least 42 credits)

Disciplinary Electives (42 credits)

Students must select at least 1 course 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

BIOL3105 Animal physiology and environmental adaptation (6)

BIOL3107 Plant physiology (6)

BIOL3108 Microbial physiology (6)

BIOL3205 Human physiology (6)

(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 ecology (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. BIOL1111 Introductory Microbiology is not offered from 2015-16. Students should take BIOL2220 Principles of Biochemistry as a replacement.
- 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 admitted to Year 1 in

2013

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 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 Combination:

NIL

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)
BIOL1111	Introductory microbiology (6)
BIOL1309	Evolutionary diversity (6)
BIOL2102	Biostatistics (6)
BIOL2103	Biological sciences laboratory course (6)
BIOL2306	Ecology and evolution (6)

2. Advanced level courses (at least 42 credits)

Disciplinary Electives (42 credits)

Students must select at least 1 course 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

BIOL3105 Animal physiology and environmental adaptation (6)

BIOL3107 Plant physiology (6)

BIOL3108 Microbial physiology (6)

BIOL3205 Human physiology (6)

(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 ecology (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. BIOL1111 Introductory Microbiology is not offered from 2015-16. Students should take BIOL2220 Principles of Biochemistry as a replacement.
- 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 admitted to Year 1 in

2012

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 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 Combination:

BIOL1110

NIL

Required courses (96 credits)

1. Introductory level courses (48 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

From molecules to cells (6)

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

Disciplinary Core Courses (36 credits)

DIOLITIO	Trom molecules to cells (o)
BIOL1111	Introductory microbiology (6)
BIOL1309	Evolutionary diversity (6)
BIOL2102	Biostatistics (6)
BIOL2103	Biological sciences laboratory course (6)
BIOL2306	Ecology and evolution (6)

2. Advanced level courses (at least 42 credits)

Disciplinary Electives (42 credits)

Students must select at least 1 course 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

BIOL3105 Animal physiology and environmental adaptation (6)

BIOL3107 Plant physiology (6)

BIOL3108 Microbial physiology (6)

BIOL3205 Human physiology (6)

(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 ecology (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. BIOL1111 Introductory Microbiology is not offered from 2015-16. Students should take BIOL2220 Principles of Biochemistry as a replacement.

- 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 Chemistry

Offered to students admitted to Year 1 in

2015

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 Combination:

Minor in Chemistry

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)

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)

CHEM4145 Medicinal chemistry (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)

CHEM4541 Physical chemistry III: statistical thermodynamics and

kinetics theory (6)

CHEM4542 Computational chemistry (6)

CHEM4543 Advanced physical chemistry (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)

- 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 Chemistry

Offered to students admitted to Year 1 in

2014

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 Combination:

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)

CHEM3241 Analytical chemistry II: chemical

instrumentation (6)

CHEM3341 Inorganic chemistry II (6)

CHEM3441 Organic chemistry II (6)

CHEM3541 Physical chemistry: Introduction to [previou

quantum chemistry (6)

[previous title: Physical chemistry II: Introduction to 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

CHEM3542 Physical chemistry: statistical

thermodynamics and kinetics theory

(6)

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

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.

List B

CHEM3141 Environmental chemistry (6)

CHEM3142 Chemical process industries and

analysis (6)

CHEM3143 Introduction to materials chemistry

(6)

CHEM3242 Food and water analysis (6)

CHEM3243 Introductory instrumental chemical

analysis (6)

CHEM3244 Analytical techniques for pharmacy

students (6)

CHEM3342 Bioinorganic chemistry (6)

CHEM3442 Organic chemistry of biomolecules

(6)

CHEIVI3443	Organic chemistry laboratory (6)
CHEM4142	Symmetry, group theory and

applications (6)

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CHEM4143 Interfacial science and technology

(6)

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

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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)

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:

Major Title Major in Chemistry

Offered to students admitted to Year 1 in

2013

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 Combination:

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)

CHEM3241 Analytical chemistry II: chemical

instrumentation (6)

CHEM3341 Inorganic chemistry II (6)

CHEM3441 Organic chemistry II (6)

CHEM3541 Physical chemistry: Introduction to

quantum chemistry (6)

[previous title: Physical chemistry II: Introduction to 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

CHEM3542 Physical chemistry: statistical Take either CHEM3542 or CHEM4541 to

thermodynamics and kinetics theory fulfill this 12 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

thermodynamics and kinetics theory 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 courses not selected to fulfill the requirements in List A.

List B

CHEM3141 Environmental chemistry (6)

(6)

CHEM3142 Chemical process industries and

analysis (6)

CHEM3143 Introduction to materials chemistry

(6)

CHEM3242 Food and water analysis (6)

CHEM3243 Introductory instrumental chemical

analysis (6)

CHEM3244 Analytical techniques for pharmacy

students (6)

CHEM3342	Bioinorganic chemistry (6)
CHEM3442	Organic chemistry of biomolecules (6)
CHEM3443	Organic chemistry laboratory (6)
CHEM4142	Symmetry, group theory and applications (6)
CHEM4143	Interfacial science and technology (6)
CHEM4144	Advanced materials (6)
CHEM4145	Medicinal chemistry (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)
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)

- 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 6credit 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 Chemistry

Offered to students admitted to Year 1 in

2012

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 Combination:

Minor in Chemistry

SCNC1112

CHEM1042

Required courses (96 credits)

1. Introductory level courses (42 credits)

Disciplinary Core Courses: Science Foundation Courses (12 credits)

General chemistry I (6)

Fundamentals of modern science (6)

SCNC1111 Scientific method and reasoning (6)

Disciplinary Core Courses (30 credits)

[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)

CHEM3241 Analytical chemistry II: chemical

instrumentation (6)

CHEM3341 Inorganic chemistry II (6)

CHEM3441 Organic chemistry II (6)

CHEM3541 Physical chemistry: Introduction to [previous in the previous in the

quantum chemistry (6)

[previous title: Physical chemistry II: Introduction to 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

CHEM3542 Physical chemistry: statistical Take either CHEM3542 or CHEM4541 to

thermodynamics and kinetics theory fulfill this 12 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

thermodynamics and kinetics theory 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 courses not selected to fulfill the requirements in List A.

List B

CHEM3141 Environmental chemistry (6)

(6)

CHEM3142 Chemical process industries and

analysis (6)

CHEM3143 Introduction to materials chemistry

(6)

CHEM3242 Food and water analysis (6)

CHEM3243 Introductory instrumental chemical

analysis (6)

CHEM3244 Analytical techniques for pharmacy

students (6)

CHEM3342	Bioinorganic chemistry (6)
CHEM3442	Organic chemistry of biomolecules (6)
CHEM3443	Organic chemistry laboratory (6)
CHEM4142	Symmetry, group theory and applications (6)
CHEM4143	Interfacial science and technology (6)
CHEM4144	Advanced materials (6)
CHEM4145	Medicinal chemistry (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)
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)

- 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 6credit 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 Decision Analytics

Offered to students admitted to Year 1 in

2015

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 decisionmaking, 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 Combination:

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 Data mining (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)

STAT3616 Advanced SAS programming (6)

STAT3620 Modern nonparametric statistics (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

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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 7. The courses MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II are deemed equivalent to MATH1013 University mathematics II and MATH2014 Multivariable calculus and linear algebra. However, students have to take two extra MATH2XXX or above level courses to replace MATH1013 and MATH2014.

Remarks:

Major Title Major in Decision Analytics

Offered to students admitted to Year 1 in

2014

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 decisionmaking, 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 Combination:

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 Data mining (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)

STAT3616 Advanced SAS programming (6)

STAT3620 Modern nonparametric statistics (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

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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 7. The courses MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II are deemed equivalent to MATH1013 University mathematics II and MATH2014 Multivariable calculus and linear algebra. However, students have to take two extra MATH2XXX or above level courses to replace MATH1013 and MATH2014.

Remarks:

Major Title Major in Decision Analytics

Offered to students admitted to Year 1 in

2013

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 decisionmaking, 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 Combination:

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 Data mining (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)

STAT3616 Advanced SAS programming (6)

STAT3620 Modern nonparametric statistics (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

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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 7. The courses MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II are deemed equivalent to MATH1013 University mathematics II and MATH2014 Multivariable calculus and linear algebra. However, students have to take two extra MATH2XXX or above level courses to replace MATH1013 and MATH2014.

Remarks:

Major Title Major in Decision Analytics

Offered to students admitted to Year 1 in

2012

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 decisionmaking, 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 Combination:

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 Data mining (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)

STAT3616 Advanced SAS programming (6)

STAT3620 Modern nonparametric statistics (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

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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 7. The courses MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II are deemed equivalent to MATH1013 University mathematics II and MATH2014 Multivariable calculus and linear algebra. However, students have to take two extra MATH2XXX or above level courses to replace MATH1013 and MATH2014.

Remarks:

Major Title Major in Earth System Science

Offered to students admitted to Year 1 in

2015

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 Combination:

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)

BIOL1309 Evolutionary diversity (6)

EASC1401 Blue Planet (6)

EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field methods (6)

EASC2404 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 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 geochemistry and geochronology (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)

- 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 admitted to Year 1 in

2014

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 Combination:

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)

BIOL1309 Evolutionary diversity (6)

EASC1401 Blue Planet (6)

EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field methods (6)

EASC2404 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)
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 geochemistry and geochronology (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)

- 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 admitted to Year 1 in

2013

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 Combination:

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)

BIOL1309 Evolutionary diversity (6)

EASC1401 Blue Planet (6)

EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field methods (6)

EASC2404 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)
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 geochemistry and geochronology (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)

- 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 admitted to Year 1 in

2012

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 Combination:

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)

BIOL1309 Evolutionary diversity (6)

EASC1401 Blue Planet (6)

EASC1402 Principles of geology (6)

EASC2401 Fluid/solid interactions in earth processes (6)

EASC2402 Field methods (6)

EASC2404 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)
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 geochemistry and geochronology (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)

- 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 admitted to Year 1 in

2015

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 Combination:

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 ecology (6)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

BIOL3109 Environmental microbiology (6)

BIOL3301 Marine biology (6)

BIOL3313 Freshwater ecology (6)

BIOL3314 Plant structure and evolution (6)

BIOL3318 Experimental intertidal ecology (6)

BIOL3319 Terrestrial ecology (6)

BIOL3320 The biology of marine mammals (6)

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

ENVS3019 Urban ecology (6)

BIOL4301 Fish and fisheries (6)

BIOL4302 Environmental impact assessment (6)

BIOL4303 Animal behaviour (6)

BIOL4861 Ecology & biodiversity internship (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3951 Ecology & biodiversity field course (6)

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 admitted to Year 1 in

2014

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 Combination:

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 ecology (6)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

BIOL3109 Environmental microbiology (6)

BIOL3301 Marine biology (6)

BIOL3313 Freshwater ecology (6)

BIOL3314 Plant structure and evolution (6)

BIOL3318 Experimental intertidal ecology (6)

BIOL3319 Terrestrial ecology (6)

BIOL3320 The biology of marine mammals (6)

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

ENVS3019 Urban ecology (6)

BIOL4301 Fish and fisheries (6)

BIOL4302 Environmental impact assessment (6)

BIOL4303 Animal behaviour (6)

BIOL4861 Ecology & biodiversity internship (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3951 Ecology & biodiversity field course (6)

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 admitted to Year 1 in

2013

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 Combination:

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 ecology (6)

Disciplinary Electives (30 credits)

At least 30 credits selected from the following courses:

BIOL3109 Environmental microbiology (6)

BIOL3301 Marine biology (6)

BIOL3313 Freshwater ecology (6)

BIOL3314 Plant structure and evolution (6)

BIOL3318 Experimental intertidal ecology (6)

BIOL3319 Terrestrial ecology (6)

BIOL3320 The biology of marine mammals (6)

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

ENVS3019 Urban ecology (6)

BIOL4301 Fish and fisheries (6)

BIOL4302 Environmental impact assessment (6)

BIOL4303 Animal behaviour (6)

BIOL4861 Ecology & biodiversity internship (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3951 Ecology & biodiversity field course (6)

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 admitted to Year 1 in

2012

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 Combination:

Minor in Ecology & Biodiversity

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)

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 courses (48 credits)

Disciplinary Core Courses (12 credits)

BIOL3302 Systematics and phylogenetics (6)

BIOL3303 Conservation ecology (6)

Disciplinary Electives (36 credits)

At least 36 credits selected from the following courses:

BIOL3109 Environmental microbiology (6)

BIOL3301 Marine biology (6)

BIOL3313 Freshwater ecology (6)

BIOL3314 Plant structure and evolution (6)

BIOL3318 Experimental intertidal ecology (6)

BIOL3319 Terrestrial ecology (6)

BIOL3320 The biology of marine mammals (6)

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

ENVS3019 Urban ecology (6)

BIOL4301 Fish and fisheries (6)

BIOL4302 Environmental impact assessment (6)

BIOL4303 Animal behaviour (6)

BIOL4861 Ecology & biodiversity internship (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3951 Ecology & biodiversity field course (6)

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 Environmental Science

Offered to students admitted to Year 1 in

2015

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/ teambased 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 Combination:

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 Environmental field and lab course (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)

May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both.

STAT1603 Introductory statistics (6)

May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both.

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 ecology (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 Environmental Science

Offered to students admitted to Year 1 in

2014

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/ teambased 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 Combination:

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 Environmental field and lab course (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)

May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both.

STAT1603 Introductory statistics (6)

May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both.

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 ecology (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 Environmental Science

Offered to students admitted to Year 1 in

2013

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/ teambased 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 Combination:

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 Environmental field and lab course (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)

May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both.

STAT1603 Introductory statistics (6)

May take either STAT1601 or STAT1603 to fulfill this 18 credits requirement, but not both.

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 ecology (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)

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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 Environmental Science

Offered to students admitted to Year 1 in

2012

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/ teambased 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 Combination:

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)

May take either STAT1601 or STAT1603 to fulfill this 12 credits requirement, but not

both.

STAT1603 Introductory statistics (6)

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 Environmental field and lab course (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 ecology (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 admitted to Year 1 in

2015

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 safety 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 Combination:

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)

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)

BIOL3207 Food and nutritional toxicology (6)

BIOL3208 Food safety and quality management (6)

BIOL3209 Food and nutrient analysis (6)

BIOL3210 Grain production and utilization (6)

BIOL3211 Nutrigenomics (6)

BIOL4201 Public health nutrition (6)

BIOL4204 Diet, brain function and behavior (6)

BIOL4205 Food processing and engineering (6)

BIOL4207 Meat and dairy sciences (6)

BIOL4209 Functional foods (6)

BIOL4210 Food product development (6)

BIOL4411 Plant and food biotechnology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3992 Directed studies in food & nutritional science (6)

BIOL4912 Sensory evaluation of food (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 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 who wish to specialize in a certain area may choose to emphasize selection of courses from the following lists:
- (a) Food Science and Technology: BIOL3207 Food and nutritional toxicology; BIOL3208 Food safety and quality management; BIOL3209 Food and nutrient analysis; BIOL3210 Grain production and utilization; BIOL4205 Food processing and engineering; BIOL4207 Meat and dairy sciences; BIOL4209 Functional foods; BIOL4210 Food product development; BIOL4411 Plant and food biotechnology.
- (b) Nutrition and Health Science: BIOL3204 Nutrition and the life cycle, BIOL3205 Human physiology; BIOL3206 Clinical nutrition; BIOL3207 Food and nutritional toxicology; BIOL3208 Food safety and quality management; BIOL3211 Nutrigenomics; BIOL4201 Public health nutrition.
- 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

Offered to students admitted to Year 1 in

2014

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 safety 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 Combination:

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)

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)

BIOL3207 Food and nutritional toxicology (6)

BIOL3208 Food safety and quality management (6)

BIOL3209 Food and nutrient analysis (6)

BIOL3210 Grain production and utilization (6)

BIOL3211 Nutrigenomics (6)

BIOL4201 Public health nutrition (6)

BIOL4204 Diet, brain function and behavior (6)

BIOL4205 Food processing and engineering (6)

BIOL4207 Meat and dairy sciences (6)

BIOL4209 Functional foods (6)

BIOL4210 Food product development (6)

BIOL4411 Plant and food biotechnology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3992 Directed studies in food & nutritional science (6)

BIOL4912 Sensory evaluation of food (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 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 who wish to specialize in a certain area may choose to emphasize selection of courses from the following lists:
- (a) Food Science and Technology: BIOL3207 Food and nutritional toxicology; BIOL3208 Food safety and quality management; BIOL3209 Food and nutrient analysis; BIOL3210 Grain production and utilization; BIOL4205 Food processing and engineering; BIOL4207 Meat and dairy sciences; BIOL4209 Functional foods; BIOL4210 Food product development; BIOL4411 Plant and food biotechnology.
- (b) Nutrition and Health Science: BIOL3204 Nutrition and the life cycle, BIOL3205 Human physiology; BIOL3206 Clinical nutrition; BIOL3207 Food and nutritional toxicology; BIOL3208 Food safety and quality management; BIOL3211 Nutrigenomics; BIOL4201 Public health nutrition.
- 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

Offered to students admitted to Year 1 in

2013

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 safety 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 Combination:

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 (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)

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not

both.

BIOL2306 Ecology and evolution (6)

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both

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)

BIOL3207 Food and nutritional toxicology (6)

BIOL3208 Food safety and quality management (6)

BIOL3209 Food and nutrient analysis (6)

BIOL3210 Grain production and utilization (6)

BIOL3211 Nutrigenomics (6)

BIOL4201 Public health nutrition (6)

BIOL4204 Diet, brain function and behavior (6)

BIOL4205 Food processing and engineering (6)

BIOL4207 Meat and dairy sciences (6)

BIOL4209 Functional foods (6)

BIOL4210 Food product development (6)

BIOL4411 Plant and food biotechnology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3992 Directed studies in food & nutritional science (6)

BIOL4912 Sensory evaluation of food (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 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 who wish to specialize in a certain area may choose to emphasize selection of courses from the following lists:
- (a) Food Science and Technology: BIOL3207 Food and nutritional toxicology; BIOL3208 Food safety and quality management; BIOL3209 Food and nutrient analysis; BIOL3210 Grain production and utilization; BIOL4205 Food processing and engineering; BIOL4207 Meat and dairy sciences; BIOL4209 Functional foods; BIOL4210 Food product development; BIOL4411 Plant and food biotechnology.
- (b) Nutrition and Health Science: BIOL3204 Nutrition and the life cycle, BIOL3205 Human physiology; BIOL3206 Clinical nutrition; BIOL3207 Food and nutritional toxicology; BIOL3208 Food safety and quality management; BIOL3211 Nutrigenomics; BIOL4201 Public health nutrition.
- 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

Offered to students admitted to Year 1 in

2012

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 safety 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 Combination:

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)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (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)

BIOL3206 Clinical nutrition (6)

BIOL3207 Food and nutritional toxicology (6)

BIOL3208 Food safety and quality management (6)

BIOL3209 Food and nutrient analysis (6)

BIOL3210 Grain production and utilization (6)

BIOL3211 Nutrigenomics (6)

BIOL4201 Public health nutrition (6)

BIOL4204 Diet, brain function and behavior (6)

BIOL4205 Food processing and engineering (6)

BIOL4207 Meat and dairy sciences (6)

BIOL4209 Functional foods (6)

BIOL4210 Food product development (6)

BIOL4411 Plant and food biotechnology (6)

3. Capstone requirement (6 credits)

At least 6 credits selected from the following courses:

BIOL3992 Directed studies in food & nutritional science (6)

BIOL4912 Sensory evaluation of food (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 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 who wish to specialize in a certain area may choose to emphasize selection of courses from the following lists:
- (a) Food Science and Technology: BIOL3207 Food and nutritional toxicology; BIOL3208 Food safety and quality management; BIOL3209 Food and nutrient analysis; BIOL3210 Grain production and utilization; BIOL4205 Food processing and engineering; BIOL4207 Meat and dairy sciences; BIOL4209 Functional foods; BIOL4210 Food product development; BIOL4411 Plant and food biotechnology.
- (b) Nutrition and Health Science: BIOL3204 Nutrition and the life cycle, BIOL3205 Human physiology; BIOL3206 Clinical nutrition; BIOL3207 Food and nutritional toxicology; BIOL3208 Food safety and quality management; BIOL3211 Nutrigenomics; BIOL4201 Public health nutrition.
- 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 Geology

Offered to students admitted to Year 1 in

2015

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 Combination:

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 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)

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:

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 Geology

Offered to students admitted to Year 1 in

2014

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 Combination:

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 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)

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:

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 Geology

Offered to students admitted to Year 1 in

2013

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 Combination:

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 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)

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:

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 Geology

Offered to students admitted to Year 1 in

2012

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 Combination:

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 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)

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:

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 Mathematics

Offered to students admitted to Year 1 in

2015

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, 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 Combination:

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)
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)

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)

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 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)

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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 6. The course MATH1821 Mathematical methods for actuarial science I is deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013.

Remarks:

Major Title Major in Mathematics

Offered to students admitted to Year 1 in

2014

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, 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 Combination:

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)
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)

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)

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 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)

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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 6. The course MATH1821 Mathematical methods for actuarial science I is deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013.

Remarks:

Major Title Major in Mathematics

Offered to students admitted to Year 1 in

2013

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, 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 Combination:

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)
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)

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)

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 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)

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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 6. The course MATH1821 Mathematical methods for actuarial science I is deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013.

Remarks:

Major Title Major in Mathematics

Offered to students admitted to Year 1 in

2012

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, 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 Combination:

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)
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)

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)

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 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)

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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 6. The course MATH1821 Mathematical methods for actuarial science I is deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013.

Remarks:

Major Title Major in Mathematics/Physics

Offered to students admitted to Year 1 in

2015

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 Combination:

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 Modern 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 PHYS4XXX 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)

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)

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 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)
PHYS4450 Advanced electromagnetism (6)

PHYS4550 Advanced statistical mechanics (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)

PHYS7350 Graduate classical mechanics (6)

PHYS7351 Graduate quantum mechanics (6)

PHYS7450 Graduate electromagnetism (6)

PHYS7550 Graduate statistical mechanics (6)

PHYS7551 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:

MATH3999 Directed studies in mathematics (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)

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. (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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.

7. The course MATH1821 Mathematical methods for actuarial science I is deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013.

Remarks:

Major Title Major in Mathematics/Physics

Offered to students admitted to Year 1 in

2014

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 Combination:

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 Modern 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

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 PHYS4XXX 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.

Quantum mechanics (6)

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)

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)

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 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)
PHYS4450 Advanced electromagnetism (6)

PHYS4550 Advanced statistical mechanics (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)

PHYS7350 Graduate classical mechanics (6)

PHYS7351 Graduate quantum mechanics (6)

PHYS7450 Graduate electromagnetism (6)

PHYS7550 Graduate statistical mechanics (6)

PHYS7551 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:

MATH3999 Directed studies in mathematics (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)

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. (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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.

7. The course MATH1821 Mathematical methods for actuarial science I is deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013.

Remarks:

Major Title Major in Mathematics/Physics

Offered to students admitted to Year 1 in

2013

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 Combination:

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 Modern 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 PHYS4XXX 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)

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)

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 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)
PHYS4450 Advanced electromagnetism (6)

PHYS4550 Advanced statistical mechanics (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)

PHYS7350 Graduate classical mechanics (6)

PHYS7351 Graduate quantum mechanics (6)

PHYS7450 Graduate electromagnetism (6)

PHYS7550 Graduate statistical mechanics (6)

PHYS7551 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:

MATH3999 Directed studies in mathematics (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)

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. (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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.

7. The course MATH1821 Mathematical methods for actuarial science I is deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013.

Remarks:

Major Title Major in Mathematics/Physics

Offered to students

admitted to Year 1 in

2012

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 Combination:

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 Modern 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 PHYS4XXX 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)

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)

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 Waves and optics (6)

PHYS3851 Atomic and nuclear physics (6)

PHYS4151 Data analysis and modeling in physics (6)

PHYS4350 Advanced classical mechanics (6)
PHYS4450 Advanced electromagnetism (6)

PHYS4550 Advanced statistical mechanics (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)

PHYS4150 Computational physics (6)

PHYS4750 Experimental physics (6)

PHYS7350 Graduate classical mechanics (6)

PHYS7351 Graduate quantum mechanics (6)

PHYS7450 Graduate electromagnetism (6)

PHYS7550 Graduate statistical mechanics (6)

PHYS7551 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:

MATH3999 Directed studies in mathematics (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)

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. (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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.

7. The course MATH1821 Mathematical methods for actuarial science I is deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013.

Remarks:

Major Title Major in Molecular Biology & Biotechnology

Offered to students admitted to Year 1 in

2015

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 Combination:

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)

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

BIOC2600 Basic biochemistry (6) Take either BIOL2220 or

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

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not

both.

BIOL2306 Ecology and evolution (6)

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both.

2. Advanced level courses (48 credits)

Disciplinary Core Courses (30 credits)

BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (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)

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 admitted to Year 1 in

2014

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 Combination:

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 credit)

BIOL1110 From molecules to cells (6)

BIOL2102 Biostatistics (6)

BIOL2103 Biological sciences laboratory course (6)

BIOL2220 Principles of biochemistry (6)

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

Take either BIOL2220 or

exclusive.

BIOC2600 Basic biochemistry (6) Take either BIOL2220 or

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

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both.

BIOL2306 Ecology and evolution (6)

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both.

2. Advanced level courses (48 credits)

Disciplinary Core Courses (30 credits)

BIOL3401 Molecular biology (6)
BIOL3402 Cell biology and cell technology (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:

BIOL3403 Immunology (6)

BIOL3404 Protein structure and function (6)

BIOL3405 Molecular microbiology (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)
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 admitted to Year 1 in

2013

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 Combination:

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)

Take either BIOL2220 or BIOC2600 to fulfill this 24 credits requirement, but not both. BIOL2220 and BIOC2600 are mutually

exclusive.

BIOC2600 Basic biochemistry (6) Take either BIOL2220 or

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

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both.

BIOL2306 Ecology and evolution (6)

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both.

2. Advanced level courses (48 credits)

Disciplinary Core Courses (30 credits)

BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (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)

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 admitted to Year 1 in

2012

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 Combination:

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

Take either BIOL2220 or

exclusive.

BIOC2600 Basic biochemistry (6) Take either BIOL2220 or

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

Disciplinary Electives (6 credits)

BIOL1309 Evolutionary diversity (6)

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both.

BIOL2306 Ecology and evolution (6)

Take either BIOL1309 or BIOL2306 to fulfill this 6 credits requirement, but not both.

2. Advanced level courses (48 credits)

Disciplinary Core Courses (30 credits)

BIOL3401 Molecular biology (6)

BIOL3402 Cell biology and cell technology (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) **BIOL3408** Genetics (6) **BIOL3409** Business aspects of biotechnology (6) Medical microbiology and applied immunology (6) **BIOL4401 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 Physics

Offered to students admitted to Year 1 in

2015

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 Combination:

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 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 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)

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)

PHYS7350 Graduate classical mechanics (6)

PHYS7351 Graduate quantum mechanics (6)

PHYS7450 Graduate electromagnetism (6)

PHYS7550 Graduate statistical mechanics (6)

PHYS7551 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 admitted to Year 1 in

2014

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 Combination:

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 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 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)

PHYS4650 Stellar physics (6)

PHYS4651 Selected topics in astrophysics (6)

PHYS4652 Planetary science (6)

PHYS4653 Cosmology (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 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

admitted to Year 1 in

2013

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 Combination:

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 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 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)

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)

PHYS7350 Graduate classical mechanics (6)

PHYS7351 Graduate quantum mechanics (6)

PHYS7450 Graduate electromagnetism (6)

PHYS7550 Graduate statistical mechanics (6)

PHYS7551 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.

Romarks:

Major Title Major in Physics

Offered to students admitted to Year 1 in

2012

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 Combination:

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 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 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)

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)

PHYS7350 Graduate classical mechanics (6)

PHYS7351 Graduate quantum mechanics (6)

PHYS7450 Graduate electromagnetism (6)

PHYS7550 Graduate statistical mechanics (6)

PHYS7551 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 Risk Management

Offered to students admitted to Year 1 in 2015

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:

- 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)
- analyze and assess risk management situations, and be able to deal with qualitative as well as PLO 2: 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 Combination:

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)

Fundamentals of modern science (6)

SCNC1111 Scientific method and reasoning (6) SCNC1112

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 Probability modelling (6)

STAT3610 Risk management and insurance (6)

STAT3612 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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 6. The courses MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II are deemed equivalent to MATH1013 University mathematics II and MATH2014 Multivariable calculus and linear algebra. However, students have to take two extra MATH2XXX or above level courses to replace MATH1013 and MATH2014.

Remarks:

Major Title Major in Risk Management

Offered to students admitted to Year 1 in

2014

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 Combination:

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 Probability modelling (6)

STAT3610 Risk management and insurance (6)

STAT3612 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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 6. The courses MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II are deemed equivalent to MATH1013 University mathematics II and MATH2014 Multivariable calculus and linear algebra. However, students have to take two extra MATH2XXX or above level courses to replace MATH1013 and MATH2014.

Remarks:

Major Title Major in Risk Management

Offered to students admitted to Year 1 in

2013

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 Combination:

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 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)

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 Probability modelling (6)

STAT3610 Risk management and insurance (6)

STAT3612 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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 6. The course MATH1821 Mathematical methods for actuarial science I is deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013.

Remarks:

Major Title Major in Risk Management

Offered to students admitted to Year 1 in

2012

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 Combination:

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 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)

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 Probability modelling (6)

STAT3610 Risk management and insurance (6)

STAT3612 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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 6. The course MATH1821 Mathematical methods for actuarial science I is deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013.

Remarks:

Major Title Major in Statistics

Offered to students

admitted to Year 1 in

2015

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 data-analytic jobs which require advanced computational skills (by means of coursework, tutorial classes and/or project-based 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 Combination:

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 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 Data mining (6)

STAT3613 Marketing engineering (6)

STAT3616 Advanced SAS programming (6)

STAT3617 Sample survey methods (6)

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

2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major

^{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.

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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 7. The courses MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II are deemed equivalent to MATH1013 University mathematics II and MATH2014 Multivariable calculus and linear algebra. However, students have to take two extra MATH2XXX or above level courses to replace MATH1013 and MATH2014.

Remarks:

Major Title Major in Statistics

Offered to students

admitted to Year 1 in

2014

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 data-analytic jobs which require advanced computational skills (by means of coursework, tutorial classes and/or project-based 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 Combination:

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 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 Data mining (6)

STAT3613 Marketing engineering (6)

STAT3616 Advanced SAS programming (6)

STAT3617 Sample survey methods (6)

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

2. Double-counting of courses up to a maximum of 24 credits is permissible when a student with a science major

^{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.

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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 7. The courses MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II are deemed equivalent to MATH1013 University mathematics II and MATH2014 Multivariable calculus and linear algebra. However, students have to take two extra MATH2XXX or above level courses to replace MATH1013 and MATH2014.

Remarks:

Major Title Major in Statistics

Offered to students admitted to Year 1 in

2013

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 data-analytic jobs which require advanced computational skills (by means of coursework, tutorial classes and/or project-based 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 Combination:

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)

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)

STAT3600 Linear statistical analysis (6)

STAT3603 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 Data mining (6)

STAT3613 Marketing engineering (6)

STAT3616 Advanced SAS programming (6)

STAT3617 Sample survey methods (6)

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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 7. The course MATH1821 Mathematical methods for actuarial science I is deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013.

Remarks:

Major Title Major in Statistics

Offered to students admitted to Year 1 in

2012

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 data-analytic jobs which require advanced computational skills (by means of coursework, tutorial classes and/or project-based 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 Combination:

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)

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)

STAT3600 Linear statistical analysis (6)

STAT3603 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 Data mining (6)

STAT3613 Marketing engineering (6)

STAT3616 Advanced SAS programming (6)

STAT3617 Sample survey methods (6)

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. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.
- 7. The course MATH1821 Mathematical methods for actuarial science I is deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013.

Remarks:

Science Minors on offer in 2015-16

SCIENCE

SECTION VI Science Minors on offer in 2015/16

Minors offered by Science Faculty

Minors (16)

Actuarial Studies

Astronomy

Biochemistry

Chemistry

Computational & Financial Mathematics

Earth Sciences

Ecology & Biodiversity

Environmental Science

Food & Nutritional Science

Marine Biology

Mathematics

Molecular Biology & Biotechnology

Physics

Plant Science

Risk Management

Statistics

Minor Title Minor in Actuarial Studies

Offered to students admitted to Year 1 in

2015

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 Combination:

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 (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)

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:

Minor Title Minor in Actuarial Studies

Offered to students admitted to Year 1 in

2014

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 Combination:

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 (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)

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:

Minor Title Minor in Actuarial Studies

Offered to students admitted to Year 1 in

2013

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 Combination:

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 (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)

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:

Minor Title Minor in Actuarial Studies

Offered to students admitted to Year 1 in

2012

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 Combination:

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 (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)

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:

Minor Title Minor in Astronomy

Offered to students admitted to Year 1 in

2015

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 Combination:

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 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 major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

Minor Title Minor in Astronomy

Offered to students admitted to Year 1 in

2014

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 Combination:

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 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 major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

Minor Title Minor in Astronomy

Offered to students admitted to Year 1 in

2013

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:

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Impermissible Combination:

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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 major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

Minor Title Minor in Astronomy

Offered to students admitted to Year 1 in

2012

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:

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Major in Astronomy

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Disciplinary Core Courses (18 credits)

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PHYS2265 Modern physics (6)

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Disciplinary Electives (24 credits)

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PHYS3650 Observational astronomy (6)

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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 major. Students who do not fulfill this requirement are advised to take PHYS1240 Physics by inquiry.

Remarks:

Minor Title Minor in Biochemistry

Offered to students admitted to Year 1 in

2015

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 Combination:

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)

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 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 admitted to Year 1 in

2014

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)
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- 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 Combination:

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)

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 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 admitted to Year 1 in

2013

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 Combination:

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)

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 Molecular medicine (6)

BIOL3202 Nutritional biochemistry (6)

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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 admitted to Year 1 in

2012

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 Combination:

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)

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 Molecular medicine (6)

BIOL3202 Nutritional biochemistry (6)

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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 admitted to Year 1 in

2015

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 Combination:

Major in Chemistry

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:

CHEM2041 Principles of chemistry (6)
CHEM2241 Analytical chemistry I (6)
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)

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)
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)
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)
CHEM4541	Physical chemistry III: statistical thermodynamics and kinetics theory (6)
CHEM4542	Computational chemistry (6)
CHEM4543	Advanced physical chemistry (6)
CHEM4910	Chemistry literacy and research (6)
CHEM4911	Capstone experience for chemistry undergraduates: HKUtopia (6)
CHEM4966	Chemistry internship (6)
CHEM4999	Chemistry project (12)

- 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 admitted to Year 1 in

2014

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 Combination:

Major in Chemistry

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)
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) [previous title: Physical chemistry I (6)]

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)

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)	
CHEM3541	Physical chemistry: Introduction to quantum chemistry (6)	[previous title: Physical chemistry II: 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)	
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)	
CHEM4541	Physical chemistry III: statistical thermodynamics and kinetics theory (6)	
CHEM4542	Computational chemistry (6)	
CHEM4543	Advanced physical chemistry (6)	
CHEM4910	Chemistry literacy and research (6)	
CHEM4911	Capstone experience for chemistry undergraduates: HKUtopia (6)	
CHEM4966	Chemistry internship (6)	
CHEM4999	Chemistry project (12)	

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- 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 admitted to Year 1 in

2013

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 Combination:

Major in Chemistry

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

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) [previous title: Physical chemistry I (6)]

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)

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)	
CHEM3541	Physical chemistry: Introduction to quantum chemistry (6)	[previous title: Physical chemistry II: 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)	
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)	
CHEM4541	Physical chemistry III: statistical thermodynamics and kinetics theory (6)	
CHEM4542	Computational chemistry (6)	
CHEM4543	Advanced physical chemistry (6)	
CHEM4910	Chemistry literacy and research (6)	
CHEM4911	Capstone experience for chemistry undergraduates: HKUtopia (6)	
CHEM4966	Chemistry internship (6)	
CHEM4999	Chemistry project (12)	

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- 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 admitted to Year 1 in

2012

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 Combination:

Major in Chemistry

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

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) [previous title: Physical chemistry I (6)]

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)

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)	
CHEM3541	Physical chemistry: Introduction to quantum chemistry (6)	[previous title: Physical chemistry II: Introduction to quantum chemistry (6)]
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CHEM4145	Medicinal chemistry (6)	
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CHEM4242	Analytical chemistry (6)	
CHEM4341	Advanced inorganic chemistry (6)	
CHEM4342	Organometallic chemistry (6)	
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CHEM4543	Advanced physical chemistry (6)	
CHEM4910	Chemistry literacy and research (6)	
CHEM4911	Capstone experience for chemistry undergraduates: HKUtopia (6)	
CHEM4966	Chemistry internship (6)	
CHEM4999	Chemistry project (12)	

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- 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 Computational & Financial Mathematics

Offered to students admitted to Year 1 in

2015

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 Combination:

Major in Mathematics Minor in 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)

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 having completed the two courses MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II are deemed to have satisfied the 18 credits Introductory Level Courses requirement of Computational & Financial Mathematics Minor. Such students should, however, take two extra MATH2XXX or above level courses to replace MATH2101 Linear algebra I and MATH2211 Multivariable calculus, and at least 30 credits of advanced level Mathematics courses (including MATH3601 & MATH3906) as chosen from the minor structure in order to fulfil the credit requirement of the Minor.
- 4. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.

Remarks:

Minor Title Minor in Computational & Financial Mathematics

Offered to students admitted to Year 1 in

2014

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.

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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)
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Major in Mathematics Minor in Mathematics

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2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

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MATH3906 Financial calculus (6)

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At least 12 credits selected from the following courses:

MATH3408 Computational methods and differential equations with

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MATH4907 Numerical methods for financial calculus (6)

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- 4. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.

Remarks:

Minor Title Minor in Computational & Financial Mathematics

Offered to students admitted to Year 1 in

2013

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.

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- PLO 3: communicate and discuss scientific issues related to mathematics (by means of coursework, tutorial classes and presentation opportunities in the curriculum)

Impermissible Combination:

Major in Mathematics Minor in Mathematics

Required courses (42 credits)

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2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

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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)

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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.

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- 3. Students having completed the two courses MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II are deemed to have satisfied the 18 credits Introductory Level Courses requirement of Computational & Financial Mathematics Minor. Such students should, however, take two extra MATH2XXX or above level courses to replace MATH2101 Linear algebra I and MATH2211 Multivariable calculus, and at least 30 credits of advanced level Mathematics courses (including MATH3601 & MATH3906) as chosen from the minor structure in order to fulfil the credit requirement of the Minor.
- 4. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.

Remarks:

Minor Title Minor in Computational & Financial Mathematics

Offered to students admitted to Year 1 in

2012

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 Combination:

Major in Mathematics Minor in 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)

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 having completed the two courses MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II are deemed to have satisfied the 18 credits Introductory Level Courses requirement of Computational & Financial Mathematics Minor. Such students should, however, take two extra MATH2XXX or above level courses to replace MATH2101 Linear algebra I and MATH2211 Multivariable calculus, and at least 30 credits of advanced level Mathematics courses (including MATH3601 & MATH3906) as chosen from the minor structure in order to fulfil the credit requirement of the Minor.
- 4. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.

Remarks:

Minor Title Minor in Earth Sciences

Offered to students admitted to Year 1 in

2015

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 Combination:

Major in Earth System Science Major in Geology

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:

List A

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)

EASC3410 Hydrogeology (6)

EASC3412 Earth resources (6)

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	EASC3413	Engineering geology (6)	
	EASC3414	Soil and rock mechanics (6)	
	EASC3415	Meteorology (6)	
	EASC3416	Advanced geochemistry and geochronology (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)	

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 Earth Sciences

Offered to students admitted to Year 1 in

2014

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 Combination:

Major in Earth System Science Major in Geology

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:

List A

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)

EASC3410 Hydrogeology (6)

EASC3412 Earth resources (6)

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	EASC3413	Engineering geology (6)	
	EASC3414	Soil and rock mechanics (6)	
	EASC3415	Meteorology (6)	
	EASC3416	Advanced geochemistry and geochronology (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)	

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 Earth Sciences

Offered to students admitted to Year 1 in

2013

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 Combination:

Major in Earth System Science Major in Geology

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:

List A

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)

EASC3410 Hydrogeology (6)

EASC3412 Earth resources (6)

- 11			
	EASC3413	Engineering geology (6)	
	EASC3414	Soil and rock mechanics (6)	
	EASC3415	Meteorology (6)	
	EASC3416	Advanced geochemistry and geochronology (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)	

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 Earth Sciences

Offered to students admitted to Year 1 in

2012

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 Combination:

Major in Earth System Science Major in Geology

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:

List A

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)

EASC3410 Hydrogeology (6)

EASC3412 Earth resources (6)

- 11			
	EASC3413	Engineering geology (6)	
	EASC3414	Soil and rock mechanics (6)	
	EASC3415	Meteorology (6)	
	EASC3416	Advanced geochemistry and geochronology (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)	

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 Ecology & Biodiversity

Offered to students admitted to Year 1 in

2015

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 Combination:

Major in Ecology & Biodiversity

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Core Courses (12 credits)

BIOL1309 Evolutionary diversity (6)
BIOL2306 Ecology and evolution (6)

Marine highery (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

BIOI 3301

BIOL3301	Marine biology (6)
BIOL3302	Systematics and phylogenetics (6)
BIOL3303	Conservation ecology (6)
BIOL3313	Freshwater ecology (6)
BIOL3314	Plant structure and evolution (6)
BIOL3318	Experimental intertidal ecology (6)
BIOL3319	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)

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 Ecology & Biodiversity

Offered to students admitted to Year 1 in

2014

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 Combination:

Major in Ecology & Biodiversity

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Core Courses (12 credits)

BIOL1309 Evolutionary diversity (6)
BIOL2306 Ecology and evolution (6)

Marine biology (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

BIOI 3301

DIOLSSUI	Marine biology (6)
BIOL3302	Systematics and phylogenetics (6)
BIOL3303	Conservation ecology (6)
BIOL3313	Freshwater ecology (6)
BIOL3314	Plant structure and evolution (6)
BIOL3318	Experimental intertidal ecology (6)
BIOL3319	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)

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Remarks:

Minor Title Minor in Ecology & Biodiversity

Offered to students admitted to Year 1 in 2013

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:

- 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)
- appreciate and describe the ecological principles underlying different policies and plans for PLO 3: biodiversity conservation and sustainable development in Hong Kong and elsewhere (by means of coursework, tutorial classes and laboratory-based learning in the curriculum)

Impermissible Combination:

Major in Ecology & Biodiversity

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)

BIOL3301	Marine biology (6)
BIOL3302	Systematics and phylogenetics (6)
BIOL3303	Conservation ecology (6)
BIOL3313	Freshwater ecology (6)
BIOL3314	Plant structure and evolution (6)
BIOL3318	Experimental intertidal ecology (6)
BIOL3319	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)

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Remarks:

Minor Title Minor in Ecology & Biodiversity

Offered to students admitted to Year 1 in

2012

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 Combination:

Major in Ecology & Biodiversity

Required courses (36 credits)

1. Introductory level courses (12 credits)

Disciplinary Core Courses (12 credits)

BIOL1309 Evolutionary diversity (6)
BIOL2306 Ecology and evolution (6)

Marine biology (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

BIOI 3301

DIOLSSUI	Marine biology (6)
BIOL3302	Systematics and phylogenetics (6)
BIOL3303	Conservation ecology (6)
BIOL3313	Freshwater ecology (6)
BIOL3314	Plant structure and evolution (6)
BIOL3318	Experimental intertidal ecology (6)
BIOL3319	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)

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 Environmental Science

Offered to students admitted to Year 1 in

2015

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/ teambased 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/ teambased learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combination:

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 (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 Environmental field and lab course (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 ecology (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.

Remarks:

Minor Title Minor in Environmental Science

Offered to students admitted to Year 1 in

2014

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/ teambased 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/ teambased learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combination:

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 (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 Environmental field and lab course (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 ecology (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.

Remarks:

Minor Title Minor in Environmental Science

Offered to students admitted to Year 1 in

2013

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/ teambased 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/ teambased learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combination:

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 (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 Environmental field and lab course (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 ecology (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.

Remarks:

Minor Title Minor in Environmental Science

Offered to students admitted to Year 1 in

2012

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/ teambased 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/ teambased learning, research projects, presentation opportunities and capstone experiences in the curriculum)

Impermissible Combination:

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 Environmental field and lab course (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 ecology (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.

Remarks:

Minor Title Minor in Food & Nutritional Science

Offered to students admitted to Year 1 in 2015

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:

- 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 Combination:

Major in Food & Nutritional Science

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)

BIOL1201 Introduction to food and nutrition (6)

BIOL2220 Principles of biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

BIOL3210

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	Food and nutritional toxicology (6)
BIOL3208	Food safety and quality management (6)
BIOL3209	Food and nutrient analysis (6)

Grain production and utilization (6)

BIOL3211	Nutrigenomics (6)	
BIOL4201	Public health nutrition (6)	
BIOL4204	Diet, brain function and behavior (6)	
BIOL4205	Food processing and engineering (6)	
BIOL4207	Meat and dairy sciences (6)	
BIOL4209	Functional foods (6)	
BIOL4210	Food product development (6)	
BIOL4411	Plant and food biotechnology (6)	
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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 admitted to Year 1 in

2014

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)
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Impermissible Combination:

Major in Food & Nutritional Science

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)

BIOL1201 Introduction to food and nutrition (6)

BIOL2220 Principles of biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

BIOL3210

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	Food and nutritional toxicology (6)
BIOL3208	Food safety and quality management (6)
BIOL3209	Food and nutrient analysis (6)

Grain production and utilization (6)

BIOL3211	Nutrigenomics (6)
BIOL4201	Public health nutrition (6)
BIOL4204	Diet, brain function and behavior (6)
BIOL4205	Food processing and engineering (6)
BIOL4207	Meat and dairy sciences (6)
BIOL4209	Functional foods (6)
BIOL4210	Food product development (6)
BIOL4411	Plant and food biotechnology (6)

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Remarks:

Minor Title Minor in Food & Nutritional Science

Offered to students admitted to Year 1 in 2013

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:

- 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)
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Impermissible Combination:

Major in Food & Nutritional Science

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)

BIOL1201 Introduction to food and nutrition (6)

BIOL2220 Principles of biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

BIOL3201

At least 24 credits selected from the following courses: Food chemistry (6)

	• • •
BIOL3202	Nutritional biochemistry (6)
BIOL3203	Food microbiology (6)
BIOL3204	Nutrition and the life cycle (6)
DIOL 220E	Lluman physicles: (C)

BIOL3205 Human physiology (6)

BIOL3206 Clinical nutrition (6)

BIOL3207 Food and nutritional toxicology (6)

BIOL3208 Food safety and quality management (6)

BIOL3209 Food and nutrient analysis (6)

BIOL3210 Grain production and utilization (6)

BIOL3211	Nutrigenomics (6)	
BIOL4201	Public health nutrition (6)	
BIOL4204	Diet, brain function and behavior (6)	
BIOL4205	Food processing and engineering (6)	
BIOL4207	Meat and dairy sciences (6)	
BIOL4209	Functional foods (6)	
BIOL4210	Food product development (6)	
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Remarks:

Minor Title Minor in Food & Nutritional Science

Offered to students admitted to Year 1 in

2012

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)
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- 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 Combination:

Major in Food & Nutritional Science

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)

BIOL1201 Introduction to food and nutrition (6)

BIOL2220 Principles of biochemistry (6)

2. Advanced level courses (24 credits)

Disciplinary Electives (24 credits)

BIOL3210

At least 24 credits selected from the following courses:

BIOL3201	Food chemistry (6)
BIOL3202	Nutritional biochemistry (6)
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Remarks:

Minor Title Minor in Marine Biology

Offered to students admitted to Year 1 in

2015

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)
- PLO 2: gain a comprehensive foundation for pursuing marine-orientated studies (by means of coursework, labtoratory-based, 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 project-based 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, labtoratory-based, and tutorial class and project-based learning in the curriculum)

Impermissible Combination:

NIL

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 ecology (6)

BIOL3318	Experimental intertidal ecology (6)
BIOL3320	The biology of marine mammals (6)
BIOL4301	Fish and fisheries (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 Marine Biology

Offered to students admitted to Year 1 in

2014

Objectives:

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Impermissible Combination:

NIL

Required courses (36 credits)

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Remarks:

Minor Title Minor in Marine Biology

Offered to students admitted to Year 1 in

2013

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.

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Impermissible Combination:

NIL

Required courses (36 credits)

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Remarks:

Minor Title Minor in Marine Biology

Offered to students admitted to Year 1 in

2012

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.

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- PLO 5: appreciate the possible implications of climate change on marine systems (by means of coursework, labtoratory-based, and tutorial class and project-based learning in the curriculum)

Impermissible Combination:

NIL

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)

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2. Advanced level courses (24 credits)

Disciplinary Core Courses (12 credits)

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Disciplinary Electives (12 credits)

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Remarks:

Minor Title Minor in Mathematics

Offered to students admitted to Year 1 in

2015

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 Combination:

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)

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	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 having completed the two courses MATH1821 Mathematical methods for actuarial Science I and MATH2822 Mathematical methods for actuarial science II are deemed to have satisfied the 18 credits introductory level courses requirement of Mathematics minor. Such students should, however, take two extra MATH2XXX or above level courses to replace MATH2101 Linear algebra I and MATH2211 Multivariable calculus, and at least 24 credits of advanced level Mathematics courses in order to fulfil the credit requirement of the Minor.
- 5. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.

Remarks:

Minor Title Minor in Mathematics

Offered to students admitted to Year 1 in

2014

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 Combination:

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)

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	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 having completed the two courses MATH1821 Mathematical methods for actuarial Science I and MATH2822 Mathematical methods for actuarial science II are deemed to have satisfied the 18 credits introductory level courses requirement of Mathematics minor. Such students should, however, take two extra MATH2XXX or above level courses to replace MATH2101 Linear algebra I and MATH2211 Multivariable calculus, and at least 24 credits of advanced level Mathematics courses in order to fulfil the credit requirement of the Minor.
- 5. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.

Remarks:

Minor Title Minor in Mathematics

Offered to students admitted to Year 1 in

2013

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 Combination:

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)

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	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 having completed the two courses MATH1821 Mathematical methods for actuarial Science I and MATH2822 Mathematical methods for actuarial science II are deemed to have satisfied the 18 credits introductory level courses requirement of Mathematics minor. Such students should, however, take two extra MATH2XXX or above level courses to replace MATH2101 Linear algebra I and MATH2211 Multivariable calculus, and at least 24 credits of advanced level Mathematics courses in order to fulfil the credit requirement of the Minor.
- 5. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.

Remarks:

Minor Title Minor in Mathematics

Offered to students admitted to Year 1 in

2012

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 Combination:

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)

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)	
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MATH4911	Mathematics capstone project (6)	
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MATH7224	Topics in advanced probability theory (6)	
MATH7501	Topics in algebra (6)	
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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.
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- 5. The two courses MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics together are deemed equivalent to MATH1013 University mathematics II. However, students have to take an extra MATH2XXX or above level course to replace MATH1013 to fulfill the credit requirement.

Remarks:

Minor Title Minor in Molecular Biology & Biotechnology

Offered to students admitted to Year 1 in

2015

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 Combination:

Major in Molecular Biology & Biotechnology

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)
BIOL2220 Principles of biochemistry (6)

Principles of biochemistry (6)

May take either BIOL2220 or
BIOC2600 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.

BIOL2102 Biostatistics (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)

BIOL3403 Immunology (6)

BIOL3409 Business aspects of 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)
ENVS4110	Environmental remediation (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 Molecular Biology & Biotechnology

Offered to students admitted to Year 1 in

2014

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.

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- 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 Combination:

Major in Molecular Biology & Biotechnology

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)
BIOL2220 Principles of biochemistry (6)

May take either BIOL2220 or BIOC2600 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.

BIOL2102 Biostatistics (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)

BIOL3403 Immunology (6)

BIOL3409 Business aspects of 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)
ENVS4110	Environmental remediation (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 Molecular Biology & Biotechnology

Offered to students admitted to Year 1 in

2013

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 Combination:

Major in Molecular Biology & Biotechnology

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)
BIOL2220 Principles of biochemistry (6)

May take either BIOL2220 or BIOC2600 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.

BIOL2102 Biostatistics (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)

BIOL3403 Immunology (6)

BIOL3409 Business aspects of 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)
ENVS4110	Environmental remediation (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 Molecular Biology & Biotechnology

Offered to students admitted to Year 1 in

2012

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 Combination:

Major in Molecular Biology & Biotechnology

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)
BIOL2220 Principles of biochemistry (6)

May take either BIOL2220 or BIOC2600 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.

BIOL2102 Biostatistics (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)

BIOL3403 Immunology (6)

BIOL3409 Business aspects of 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)
ENVS4110	Environmental remediation (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 Physics

Offered to students admitted to Year 1 in

2015

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 Combination:

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 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

PHYS3652

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

PHYS3550 Statistical mechanics & thermodynamics (6)

Principles of astronomy (6)

PHYS3551 Introductory solid state physics (6)

PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)

PHYS3750 Laser and spectroscopy (6)

PHYS3751 Physics of nanomaterials (6)

PHYS3850 Waves and optics (6)

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	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)	
	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)	
	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	Solid state physics (6)	
	PHYS7650	Stellar atmospheres (6)	
	PHYS7750	Nanophysics (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.
- 2. 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:

Minor Title Minor in Physics

Offered to students admitted to Year 1 in

2014

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 Combination:

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 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

PHYS3652

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

PHYS3550 Statistical mechanics & thermodynamics (6)

Principles of astronomy (6)

PHYS3551 Introductory solid state physics (6)

PHYS3650 Observational astronomy (6)
PHYS3651 The physical universe (6)

PHYS3750 Laser and spectroscopy (6)

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PHYS3751 Physics of nanomaterials (6)

PHYS3850 Waves and optics (6)

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	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)	
	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)	
	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	Solid state physics (6)	
	PHYS7650	Stellar atmospheres (6)	
	PHYS7750	Nanophysics (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.
- 2. 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:

Minor Title Minor in Physics

Offered to students admitted to Year 1 in 2013

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:

- identify and describe physical systems with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- analyze some physics problems qualitatively and quantitatively (by means of coursework, tutorial PLO 2 : 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 Combination:

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 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) PHYS3350 Classical mechanics (6) PHYS3351 Quantum mechanics (6) **PHYS3450** Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

Principles of astronomy (6)

PHYS3551 Introductory solid state physics (6)

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

PHYS3750 Laser and spectroscopy (6)

PHYS3751 Physics of nanomaterials (6)

PHYS3850 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)	
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)	
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	Solid state physics (6)	
PHYS7650	Stellar atmospheres (6)	
PHYS7750	Nanophysics (6)	
	PHYS3999 PHYS4150 PHYS4151 PHYS4350 PHYS4351 PHYS4450 PHYS4650 PHYS4650 PHYS4651 PHYS4652 PHYS4653 PHYS4655 PHYS4655 PHYS4750 PHYS4966 PHYS4999 PHYS7351 PHYS7350 PHYS7550 PHYS7551 PHYS7650	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) 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) PHYS4999 Physics internship (6) PHYS4999 Physics project (12) PHYS7350 Graduate classical mechanics (6) PHYS7351 Graduate quantum mechanics (6) PHYS7550 Graduate statistical mechanics (6) PHYS7551 Solid state physics (6) PHYS7551 Solid state physics (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.
- 2. 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:

Minor Title Minor in Physics

Offered to students admitted to Year 1 in 2012

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:

- identify and describe physical systems with fundamental knowledge in physics (by means of coursework and tutorial classes in the curriculum)
- analyze some physics problems qualitatively and quantitatively (by means of coursework, tutorial PLO 2 : 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 Combination:

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 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) PHYS3350 Classical mechanics (6) PHYS3351 Quantum mechanics (6) **PHYS3450** Electromagnetism (6)

PHYS3550 Statistical mechanics & thermodynamics (6)

Principles of astronomy (6)

PHYS3551 Introductory solid state physics (6)

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

PHYS3750 Laser and spectroscopy (6)

PHYS3751 Physics of nanomaterials (6)

PHYS3850 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)	
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)	
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	Solid state physics (6)	
PHYS7650	Stellar atmospheres (6)	
PHYS7750	Nanophysics (6)	
	PHYS3999 PHYS4150 PHYS4151 PHYS4350 PHYS4351 PHYS4450 PHYS4650 PHYS4650 PHYS4651 PHYS4652 PHYS4653 PHYS4655 PHYS4655 PHYS4750 PHYS4966 PHYS4999 PHYS7351 PHYS7350 PHYS7550 PHYS7551 PHYS7650	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) 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) PHYS4999 Physics internship (6) PHYS4999 Physics project (12) PHYS7350 Graduate classical mechanics (6) PHYS7351 Graduate quantum mechanics (6) PHYS7550 Graduate statistical mechanics (6) PHYS7551 Solid state physics (6) PHYS7551 Solid state physics (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.
- 2. 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:

Minor Title Minor in Plant Science

Offered to students admitted to Year 1 in

2015

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 Combination:

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:

Minor Title Minor in Plant Science

Offered to students admitted to Year 1 in

2014

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 Combination:

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:

Minor Title Minor in Plant Science

Offered to students admitted to Year 1 in

2013

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 Combination:

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:

Minor Title Minor in Plant Science

Offered to students admitted to Year 1 in

2012

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 Combination:

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:

Minor Title Minor in Risk Management

Offered to students admitted to Year 1 in

2015

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 Combination:

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)

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 Data mining (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)

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 Risk Management

Offered to students admitted to Year 1 in

2014

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 Combination:

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)

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 Data mining (6)

STAT3614 Business forecasting (6)

STAT3615 Practical mathematics for investment (6)

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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)
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Remarks:

Minor Title Minor in Risk Management

Offered to students admitted to Year 1 in

2013

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 Combination:

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)

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 Data mining (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)

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 Risk Management

Offered to students admitted to Year 1 in

2012

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 Combination:

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)

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 Data mining (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)

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 admitted to Year 1 in

2015

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 Combination:

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)

STAT2603 Data management with SAS (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 Probability modelling (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	Data mining (6)	
STAT3613	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)	
STAT3955	Survival analysis (6)	
STAT4601	Time-series analysis (6)	
STAT4602	Multivariate data analysis (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 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 Combination:

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)

STAT2603 Data management with SAS (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 Probability modelling (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	Data mining (6)	
STAT3613	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)	
STAT3955	Survival analysis (6)	
STAT4601	Time-series analysis (6)	
STAT4602	Multivariate data analysis (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 Statistics

Offered to students admitted to Year 1 in

2013

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 Combination:

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)

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 Probability modelling (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	Data mining (6)
STAT3613	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)
STAT3955	Survival analysis (6)
STAT4601	Time-series analysis (6)
STAT4602	Multivariate data analysis (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 Statistics

Offered to students admitted to Year 1 in

2012

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 Combination:

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)

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 Probability modelling (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	Data mining (6)
STAT3613	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)
STAT3955	Survival analysis (6)
STAT4601	Time-series analysis (6)
STAT4602	Multivariate data analysis (6)
	STAT3606 STAT3607 STAT3608 STAT3611 STAT3612 STAT3613 STAT3614 STAT3616 STAT3617 STAT3620 STAT3621 STAT3621 STAT3955 STAT4601

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:

Students taking double Majors,

Major-Minor or double Minors with overlapping course requirements

SCIENCE

SECTION VII

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	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 Mathematics/Physics	5 (30 credits)	1 (6 credits)
Major in Astronomy Major in Physics	6 (36 credits)	2 (12 credits)
Major in Biochemistry Major in Molecular Biology & Biotechnology	5 (30 credits)	1 (6 credits)
Major in Biological Sciences Major in Ecology & Biodiversity	7 (42 credits)	3 (18 credits)
Major in Biological Sciences Major in Food & Nutritional Science	6 (36 credits)	2 (12 credits)
Major in Biological Sciences Major in Molecular Biology & Biotechnology	5 (30 credits)	1 (6 credits)
Major in Earth System Science Major in Geology	5 (30 credits)	1 (6 credits)
Major in Ecology & Biodiversity Major in Food & Nutritional Science	6 (36 credits)	2 (12 credits)
Major in Ecology & Biodiversity Major in Molecular Biology & Biotechnology	5 (30 credits)	1 (6 credits)
Major in Food & Nutritional Science Major in Molecular Biology & Biotechnology	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 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 Biological Sciences ('Major 1') and the 2nd major in Molecular Biology & Biotechnology ('Major 2'), SCNC1111, SCNC11110, BIOL1100 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. Another example is a 1st major in Biochemistry and a 2nd major in Molecular Biology & Biotechnology. SCNC1111, SCNC1112, BIOL1110, BIOC2600 and BIOL3401 are the 5 common courses that appear in both majors. Students can have the first 4 courses SCNC1111, SCNC11112, BIOL11110, BIOC2600 double counted in both majors but have to take a replacement 'disciplinary elective' course (with a prefix of BIOL at level 3 or above) for BIOL3401 in the 2nd major in Molecular Biology & Biotechnology.

- 3. 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.
- 4. For the situations of 2 and 3 above, students have to complete the application form, seek the written endorsement from the Course Selection Adviser of the second major ('Major 2') / minor and then return it to the <u>Faculty Office</u> by the closing dates of course selection or add/drop periods.

Degree Regulations

SCIENCE

SECTION VIII 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 in the academic year 2012-2013 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 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	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 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 CURRICULA¹

Regulations for First Degree Curricula (for students admitted under the 4-year '2012 curriculum' to the first year of first degree curricula in 2014-15 and thereafter)

(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.

'Course' means a course of study, with a credit value expressed as a number of credit-units

These regulations are applicable to candidates admitted from 2014-15 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 2012-13 for the cohort admitted in 2012-13 under the 3-year '2010 curriculum'.)

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:

$$GPA = \frac{\sum_{i} Course \ Grade \ Point \times Course \ Credit \ Value}{\sum_{i} Course \ Credit \ Value}$$

(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 one course from the same Area of Inquiry 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:

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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 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.

exempted must replace the number of exempted credits with courses of the same credit value.

UG 7 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+)		3.3
В	}	Good	3.0
В-	J		2.7
C+	1		2.3
C	}	Satisfactory	2.0
C-	J	•	1.7
D+	ì	Dogg	1.3
D	5	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.

UG 9 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:

<u>Class of honours</u>	<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 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 1

Regulations for First Degree Curricula (for students admitted under the 4-year '2012 curriculum' to the first year of first degree curricula in 2012-13 and 2013-14 and students admitted directly to the third year in 2014-15)

(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.

'Course' means a course of study, with a credit value expressed as a number of credit-units

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These regulations are applicable to candidates admitted 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) to the first year of first degree curricula in 2012-13 and 2013-14. 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.

⁽Please refer to the Calendar for 2011-12 for the Regulations for First Degree Curricula applicable to cohorts admitted in 2010-11 and 2011-12 under the 3-year '2010 curriculum'.)

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:

$$GPA = \frac{\sum_{i} Course \ Grade \ Point \times Course \ Credit \ Value}{\sum_{i} Course \ Credit \ Value}$$

(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 elsewhere before admission to the University. 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:
 - 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, selecting not more than one course from the same Area of Inquiry within one academic year and at least one and not more than two courses from each Area of Inquiry⁵ during the whole period of study; 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.

UG 7 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
В-	J		2.7
C+	1		2.3
C	}	Satisfactory	2.0
C-	J	•	1.7
D+	l	Pass	1.3
D	ſ	газз	1.0
F		Fail	0

(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

⁶ UG 8 is not applicable to the BDS and MBBS curricula.

UG 9 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	<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 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.

Teaching Weeks

SCIENCE

Teaching Weeks 2015-2016 for Undergraduate and Taught Postgraduate Students

	SUN	MON	TUE	WED	THUR	FRI	SAT	Week	FIRST SEMESTER: SEP 1 - DEC 23, 2015
		7	1 8	2 9	[3] 10	4 11	5	1	First Day of Teaching: Sep 1, 2015
SEP-15	6 13	14	6 15	9 16	17	18	12 19	2 3	
	20	21	22	23	24	25	26	4	
	27	[28]	29	30				5	
		-		7	[1]	2	3		
OCT-15	4 11	5 12	6 13	7 14	8 15	9 16	10 17	6 7 (Reading)	Reading/ Field Trip Week: Oct 12 - 17, 2015
001-13	18	19	20	[21]	22	23	24	8	Reading Field Trip Week. Oct 12 17, 2013
	25	26	27	28	29	30	31	9	
	1	2	3	4	5	6	7	10	
NOV-15	8 15	9 16	10 17	11 18	12 19	13 20	14 21	11 12	
110 12	22	23	24	25	26	27	28	13	
	29	30							Last Day of Teaching: Nov 30, 2015
		_	1	2	3	4	5		Revision Period: Dec 1 - 7, 2015
DEC-15	6 13	7 14	8 15	9 16	10 17	11 18	12 19	15 16	Assessment Period: Dec 8 - 23, 2015
DEC-13	20	21	22	23	(24)	[25]	[26]	17	
	27	28	29	30	<31>	[]	[==]	18 (Break)	
						[1]	2		
	3	4	5	6	7	8	9	19 (Break)	CECOND CEMECRED TANA 0 35137 40 2017
JAN-16	10 17	11	12 19	13 20	21	15 22	16 23	20 (Break) 21	SECOND SEMESTER: JAN 18 - MAY 28, 2016 First Day of Teaching: Jan 18, 2016
	24	25	26	27	28	29	30	22	That Day of Teaching, Jan 16, 2010
	31								
		1	2	3	4	5	6	23	Class Suspension Period for the Lunar New Year:
FEB-16	7 14	[8]	[9]	[10]	11	12	$\underbrace{13}_{20}$	24 25	Feb 8 - 13, 2016
FED-10	21	22	23	24	25	26	27	26	
	28	29					_,	27	
			1	2	3	4	5		
MAD 16	6	7	8	9	10	11	12		Reading/ Field Trip Week: Mar 7 - 12, 2016
MAR-16	13 20	14 21	15 22	(16) 23	17 24	18 [25]	19 [26]	29 30	
	27	[28]	29	30	31	[20]	[20]	31	
						1	2		
APR-16	3	[4] 11	5 12	6 13	7 14	8 15	9	32 33	
AFK-10	10 17	18	19	20	21	22	16 23	34	
	24	25	26	27	28	29	30	35	Last Day of Teaching: Apr 30, 2016
	1	[2]	3	4	5	6	7		Revision Period: May 2 - 7, 2016
MAY-16	8 15	9 16	10 17	11 18	12 19	13 20	[14] 21	37 38	Assessment Period: May 9 - 28, 2016
WIA 1-10	22	23	24	25	26	27	28	39	
	29	30	31	π				40 (Break)	
				1	2	3	4		
TIDI 16	5	6 13	7 14	8 15	[9]	10 17	11 18	41 (Break) 42 (Break)	
JUN-16	12 19	20	21	22	16 23	24	25	42 (Break) 43 (Break)	OPTIONAL SUMMER SEMESTER
	26	27	28	29	30			44	Jun 27 - Aug 20, 2016
		_				[1]	2		-
	3	4	5	6	7	8	9	45	
JUL-16	10 17	11 18	12 19	13 20	14 21	15 22	16 23	46 47	
	24	25	26	27	28	29	30	48	
	31	_							
		1	2	3	4	5	6	49	
AUG-16	7 14	8 15	9 16	10 17	11 18	12 19	13 20	50 51	
AUG-10	21	22	23	24	25	26	27	52 (Break)	
	28	29	30	31				53 (Break)	
[] General	Holiday				Reading/ F	ield Trip	Week		
() Universi	ity Holida	y (Full Day)			Revision P	eriod			
<> Univers					_		eriod for the l	Lunar New Year	
			= "		_	nt Period			

List of BSc Courses and English and

Chinese language courses on offer in 2015-16 and 2016-17

SCIENCE

SECTION X List of BSc Courses on offer in 2015/16 and 2016/17[^]

Course Code	Title	Credi	t Pre-requisite	Availa	ıble in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / Minor (The Major/Minor that this course appears as)				
						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective		
	Biomedical Sciences														
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 (2014,2013,2012)	Major in Biochemistry (2015); Minor in Biochemistry (2015,2014,2013,2012)				
3IOC2600	Basic biochemistry	6	Pass in BIOC1600 Perspectives in biochemistry or BIOL1110 From molecules to cells or ENGG1207 Foundation of biochemistry for medical engineering; and Not for students who have passed in BIOL2220 Principles of biochemistry or MEDE2301 Life sciences I (Biochemistry), already enrolled in this course.	Y	Y	1	Dec	300	Prof D K Y Shum, Biomedical Sciences	Major in Biochemistry (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)	Minor in Biochemistry (2015,2014,2013,2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012)				
BIOC3601	Basic metabolism	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or MEDE2301 Life sciences I (Biochemistry)	Y	Y	1	Dec	80	Dr N S Wong, Biomedical Sciences	Major in Biochemistry (2015,2014,2013,2012)	Minor in Biochemistry (2015,2014,2013,2012)				
3IOC3602	Understanding metabolism diseases	6	Pass in BIOC3601 Basic metabolism	N	N			40	Dr L Y L Cheng, Biomedical Sciences						
BIOC3604	Essential techniques in biochemistry and molecular biology	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or MEDE2301 Life science I	Y	Y	2	May	70	Dr K M Yao, Biomedical Sciences	Major in Biochemistry (2015,2014,2013,2012)	Minor in Biochemistry (2015,2014,2013,2012)				
3IOC3605	Sequence bioinformatics	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or BBMS2003 Human genetics or BBMS2007 Essential molecular biology or MEDE2301 Life science I	Y	Y	2	May	50	Dr B C W Wong, Biomedical Sciences		Major in Biochemistry (2015,2014,2013,2012); Minor in Biochemistry (2015,2014,2013,2012)				
BIOC3606	Molecular medicine	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or MEDE2301 Life science I	Y	Y	2	May	50	Prof D Y Jin, Biomedical Sciences		Major in Biochemistry (2015,2014,2013,2012); Minor in Biochemistry (2015,2014,2013,2012)				
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 Basic biochemistry and BIOL3401 Molecular biology. 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	36	Prof J D Huang, Biomedical Sciences				Major in Biochemistry (2015,2014,2013,2012)		
BIOC4610	Advanced biochemistry	6	Pass in BIOC3601 Metabolism or BIOL3401 Molecular biology or BIOL3402 Cell biology and cell technology or BIOL3404 Protein structure and function	Y	Y	1	Dec	50	Dr K M Yao, Biomedical Sciences	Major in Biochemistry (2015,2014,2013,2012)	Minor in Biochemistry (2015,2014,2013,2012)				
SIOC4611	Advanced biochemistry II	6	Pass in BIOC3601 Metabolism; and BIOL3404 Protein structure and function or CHEM2441 Organic chemistry I; and Pass in BIOC4610 Advanced biochemistry, or already enrolled in this course	N	N			50	Prof D Chan, Biomedical Sciences						
BIOC4612	Molecular biology of the gene	6	Pass in BIOC3601 Metabolism or BIOL3401 Molecular biology or BIOL3402 Cell biology and cell technology or BIOL3404 Protein structure and function or BBMS2007 Essential molecular biology	Y	Y	2	May	50	Prof K S E Cheah, Biomedical Sciences		Major in Biochemistry (2015,2014,2013,2012); Minor in Biochemistry (2015,2014,2013,2012)				
3IOC4613	Advanced techniques in biochemistry & molecular biology	6	Pass in BIOC3604 Essential techniques in biochemistry and molecular biology	Y	Y	1	Dec	70	Prof D Chan, Biomedical Sciences	Major in Biochemistry (2015,2014,2013,2012)	Minor in Biochemistry (2015,2014,2013,2012)				

[^] Availability of courses in 2016-2017 is subject to change.

Course Code	Title	Credi	t Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	a Course Coordinator		Major / M (The Major/Minor that this		
		n				0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	Biolmedical Sciences (Cont'o	-	Pass in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in Biochemistry Major including BIOC3604 Essential techniques in biochemistry & molecular biology. 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	1, 2, S	No exam	20	Prof J D Huang, Biomedical Sciences				Major in Biochemistry (2015,2014,2013,2012)
3IOC4999	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 Molecular biology, BIOC3601 Basic metabolism, and BIOC3604 Essential techniques in biochemistry and molecular biology; and BIOC4610 Advanced biochemistry and BIOC4610 Advanced techniques in biochemistry & molecular biology. BIOC4610 Advanced biochemistry and BIOC4613 Advanced techniques in biochemistry & molecular biology and because the biochemistry & molecular biology can be taken concurrently with this course. 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	0	No exam	25	Dr N S Wong, Biomedical Sciences				Major in Biochemistry (2015,2014,2013,2012)
chool of E	Biological Sciences												
	From molecules to cells		NIL	Y	Y	1, 2	Dec, May	169	Biological Sciences	Major in Biochemistry (2014,2013,2012); Major in Biological Sciences (2015,2014,2013,2012); Major in Ecology & Biodiversity (2015,2014,2013,2012); Major in Food & Nutritional Science (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)	(2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Plant Science (2015,2014,2013,2012)		
BIOL1111	Introductory microbiology	6	NIL	N	N			80	TBC, Biological Sciences	Major in Biological Sciences (2015,2014,2013,2012)			
BIOL1201	Introduction to food and nutrition	6	NIL	Y	Y	1	Dec	110	Prof N P Shah, Biological Sciences	Major in Food & Nutritional Science (2015,2014,2013,2012)	Minor in Food & Nutritional Science (2015,2014,2013,2012)		
3IOL1309	Evolutionary diversity	6	NIL	Y	Y	2	May	105	Prof R M K Saunders, Biological Sciences	Major in Food & Nutritional Science (2015); Major in Biological Sciences (2015,2014,2013,2012); Major in Earth System Science (2015,2014,2013,2012); Major in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012);	Major in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Marine Biology (2015,2014,2013,2012); Minor in Plant Science (2015,2014,2013,2012)		

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						0=year long 1=1st sem 2=2nd sem S=Summer	2010 2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective		
	Biological Sciences (Cont'd)		Lauri		Y			40	D (500)						
IOL1501			NIL	N	i.			40	Prof F C C Leung, 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	Y			50	Prof F C C Leung, Biological Sciences						
3IOL2102	Biostatistics	6	Pass in BIOC1600 Perspectives in biochemistry or BIOL1110 From molecules to cells or BIOL2306 Ecology and evolution or ENVS1301 Environmental life science or ENVS2002 Environmental data analysis	Y	Y	2	May	135	Dr G Panagiotou, Biological Sciences	Major in Biological Sciences (2015,2014,2013,2012); Major in Ecology & Biodiversity (2015,2014,2013,2012); Major in Food & Nutritional Science (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)	Major in Environmental Science (2015,2014,2013,2012); Minor in Environmental Science (2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012)				
IOL2103	Biological sciences laboratory course	6	Pass in BIOL1110 From molecules to cells	Y	Y	1, 2	Dec, May	215	Dr W Y Lui, Biological Sciences	Major in Biological Sciences (2015,2014,2013,2012); Major in Ecology & Biodiversity (2015,2014,2013,2012); Major in Food & Nutritional Science (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)	Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Plant Science (2015,2014,2013,2012)				
BIOL2220	Principles of biochemistry	6	Pass in BIOL1110 From molecules to cells; and Not for students who have passed in BIOC2600 Basic biochemistry or have already enrolled in this course.	Y	Y	1	Dec	100	Dr C S C Lo, Biological Sciences	Major in Food & Nutritional Science (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)	Minor in Food & Nutritional Science (2015,2014,2013,2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Plant Science (2015,2014,2013,2012)				
IOL2306	Ecology and evolution	6	Pass in BIOL1309 Evolutionary diversity or BIOL1110 From molecules to cells or ENVS1301 Environmental life science or ENVS1401 Introduction to environmental science	Y	Y	1	Dec	80	Prof D Dudgeon, Biological Sciences	Major in Biological Sciences (2015,2014,2013,2012); Major in Ecology & Biodiversity (2015,2014,2013,2012); Major in Food & Nutritional Science (2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012)	Major in Environmental Science (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Marine Biology (2015,2014,2013,2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012)				
BIOL3105	Animal physiology and environmental adaptation	6	Pass in BIOL2103 Biological sciences laboratory course or BIOL2220 Principles of biochemistry or BIOL2102 Biostatistics or BIOL2306 Ecology and evolution	Y	Y	2	May	40	Prof A O L Wong, Biological Sciences		Major in Biological Sciences (2015,2014,2013,2012)				
3IOL3107	Plant physiology	6	Pass in BIOL2103 Biological sciences laboratory course	Y	Y	1	Dec	30	Dr W K Yip, Biological Sciences		Major in Biological Sciences (2015,2014,2013,2012); Minor in Plant Science (2015,2014,2013,2012)				

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						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
School of	Biological Sciences (Cont'd)												
BIOL3108	Microbial physiology	6	Pass in BIOL2103 Biological sciences laboratory course	Y	Y	1	Dec	50	Dr A Yan, Biological Sciences		Major in Biological Sciences (2015,2014,2013,2012)		
BIOL3109	Environmental microbiology	6	Pass in BIOL2103 Biological sciences laboratory course	Y	Y	2	May	40	Dr J D Gu, Biological Sciences		Major in Biological Sciences (2015,2014,2013,2012); Major in Ecology & Biodiversity (2015,2014,2013,2012)		
BIOL3110	Environmental toxicology	6	Pass in BIOL2103 Biological sciences laboratory course or ENVS3042 Pollution or CHEM3141 Environmental chemistry	Y	Y	1	Dec	60	Dr J D Gu, Biological Sciences		Major in Biological Sciences (2015,2014,2013,2012); Major in Environmental Science (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
BIOL3201	Food chemistry	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry	Y	Y	2	May	60	Dr J C Y Lee, Biological Sciences	Major in Food & Nutritional Science (2015,2014,2013,2012)	Minor in Food & Nutritional Science (2015,2014,2013,2012)		
BIOL3202	Nutritional biochemistry	6	Pass in BIOL2220 Principles of biochemistry or BIOC2600 Basic biochemistry or MEDE2301 Life science I	Y	Y	1	Dec	100	Dr E T S Li, Biological Sciences	Major in Food & Nutritional Science (2015,2014,2013,2012)	Major in Biochemistry (2015,2014,2013,2012); Minor in Biochemistry (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012)		
BIOL3203	Food microbiology	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry	Υ	Y	2	May	60	Dr H S El-Nezami, Biological Sciences	Major in Food & Nutritional Science (2015,2014,2013,2012)	Minor in Food & Nutritional Science (2015,2014,2013,2012)		
BIOL3204	Nutrition and the life cycle	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or BIOL3202 Nutritional biochemistry	Y	Y	2	May	70	Dr E T S Li, Biological Sciences		Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012)		
3IOL3205	Human physiology	6	Pass in BIOL2103 Biological sciences laboratory course	Y	Y	1	Dec	120	Dr W Y Lui, Biological Sciences		Major in Biological Sciences (2015,2014,2013,2012); Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012)		
BIOL3206	Clinical nutrition	6	Pass in BIOL3202 Nutritional biochemistry or BIOL3203 Food microbiology or BIOL3204 Nutrition and the life cycle or BIOL3205 Human physiology	Y	Y	2	May	70	Dr J M F Wan, Biological Sciences		Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012)		
BIOL3207	Food and nutritional toxicology	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or BIOL3205 Human physiology	Y	Y	2	May	80	Dr H S El-Nezami, Biological Sciences		Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012)		

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	Biological Sciences (Cont'd) Food safety and quality management	6	Pass in BIOL3201 Food chemistry or BIOL3203 Food microbiology	Y	Y	1	Dec	40	Prof H Corke, Biological Sciences		Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012)		
IOL3209	Food and nutrient analysis	6	Pass in BIOL3201 Food chemistry	Y	Y	1	Dec	70	Dr M F Wang, Biological Sciences		Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012)		
IIOL3210	Grain production and utilization	6	Pass in any level 2 BIOL course	Y	Y	1	Dec	40	Prof H Corke, Biological Sciences		Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012); Minor in Plant Science (2015,2014,2013,2012)		
IIOL3211	Nutrigenomics	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry	Y	Y	2	May	40	Dr K C Tan-Un, Biological Sciences		Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012)		
BIOL3301	Marine biology	6	Pass in BIOL2306 Ecology and evolution or ENVS2002 Environmental data analysis	Y	Y	2	May	40	Dr M Yasuhara, Biological Sciences	Minor in Marine Biology (2015,2014,2013,2012)	Major in Biological Sciences (2015,2014,2013,2012); Major in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012)		
BIOL3302	Systematics and phylogenetics	6	Pass in BIOL1309 Evolutionary diversity and any level 2 BIOL course	Y	Y	1	Dec	60	Prof R M K Saunders, Biological Sciences	Major in Ecology & Biodiversity (2015,2014,2013,2012)	Major in Biological Sciences (2015,2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012)		
IOL3303	Conservation ecology	6	Pass in BIOL2306 Ecology and evolution	Y	Y	2	May	40	Dr T C Bonebrake, Biological Sciences	Major in Ecology & Biodiversity (2015,2014,2013,2012)	Major in Biological Sciences (2015,2014,2013,2012); Major in Environmental Science (2015,2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012); Minor in Marine Biology (2015,2014,2013,2012)		
3IOL3313	Freshwater ecology	6	Pass in BIOL2102 Biostatistics and BIOL2306 Ecology and evolution	N	Y			30	Prof D Dudgeon, Biological Sciences		Major in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012)		

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	Biological Sciences (Cont'd) Plant structure and evolution	6	Pass in BIOL1309 Evolutionary diversity and any level 2 BIOL course	Y	Y	2	May	30	Prof R M K Saunders, Biological Sciences		Major in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Plant Science (2015,2014,2013,2012)		
BIOL3318	Experimental intertidal ecology	6	Pass in BIOL2102 Biostatistics or BIOL3301 Marine biology	Y	Y	2	May	20	Prof G A Williams, Biological Sciences		Major in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Marine Biology (2015,2014,2013,2012)		
BIOL3319	Terrestrial ecology	6	Pass in BIOL3303 Conservation ecology	Y	Y	2	May	30	Dr B Guenard, Biological Sciences		Major in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012)		
BIOL3320	The biology of marine mammals	6	Pass in BIOL2306 Ecology and evolution	Y	N	1	Dec	30	Dr L Karczmarski, Biological Sciences		Major in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Marine Biology (2015,2014,2013,2012)		
BIOL3401	Molecular biology	6	Pass in BIOL2103 Biological sciences laboratory course or BIOL2220 Principles of biochemistry or BIOC2600 Basic biochemistry or MEDE2301 Life science I	Y	Y	1	Dec	130	Prof B K C Chow, Biological Sciences	Major in Biochemistry (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012)	Major in Biological Sciences (2015,2014,2013,2012); Minor in Biochemistry (2015,2014,2013,2012)		
BIOL3402	Cell biology and cell technology	6	Pass in BIOL2103 Biological sciences laboratory course or BIOL2220 Principles of biochemistry or BIOC2600 Basic biochemistry or MEDE2301 Life science I	Y	Y	1	Dec	120	Prof A S T Wong, Biological Sciences	Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)	Major in Biochemistry (2015,2014,2013,2012); Major in Biological Sciences (2015,2014,2013,2012); Minor in Biochemistry (2015,2014,2013,2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012)		
BIOL3403	Immunology	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or BIOL2103 Biological sciences laboratory course or MEDE2301 Life science I	Y	Y	2	May	100	Prof W W M Lee, Biological Sciences		Major in Biochemistry (2015,2014,2013,2012); Major in Biological Sciences (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Biochemistry (2015,2014,2013,2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012)		

Course Code	Title	Credi	Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	a Course Coordinator		Major / Mi (The Major/Minor that this		
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	Siological Sciences (Cont'd) Protein structure and function	6	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or MEDE2301 Life science I	Y	Y	2	May	160	Dr W K Yip, Biological Sciences		Major in Biochemistry (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Biochemistry (2015,2014,2013,2012)		
BIOL3405	Molecular microbiology	6	Pass in BIOL2103 Biological sciences laboratory course	Y	Y	2	May	30	Dr J S H Tsang, Biological Sciences		Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)		
BIOL3406	Reproduction and reproductive biotechnology	6	Pass in BIOL2103 Biological sciences laboratory course or BIOL2220 Principles of biochemistry or BIOL2102 Biostatistics or BIOL2306 Ecology and evolution	Y	Y	1	Dec	40	Prof A O L Wong, Biological Sciences		Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)		
BIOL3408	Genetics	6	Pass in BIOL2103 Biological sciences laboratory course	Y	Y	1	Dec	50	Dr C S C Lo, Biological Sciences		Major in Biochemistry (2015,2014,2013,2012); Major in Biological Sciences (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Plant Science (2015,2014,2013,2012)		
BIOL3409	Business aspects of biotechnology	6	Pass in any level 2 BIOL or BIOC course	Y	Y	2	No exam	40	Dr W B L Lim, Biological Sciences		Major in Biological Sciences (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012)		
BIOL3419	Insect ecology: the little things that run the world	6	Pass in BIOL1309 Evolutionary diversity and BIOL2306 Ecology and evolution	Y	Y	1	Dec	25	Dr B Guenard, Biological Sciences		Major in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012)		
BIOL3501	Evolution	6	Pass in BIOL2306 Ecology and evolution	N	Y			50	Dr M Sun, Biological Sciences		(
BIOL3502	Conservation genetics	6	Pass in BIOL2306 Ecology and evolution or BIOL3303 Conservation ecology or BIOL3408 Genetics	Y	Y	2	May	50	Dr M Sun, Biological Sciences				
BIOL3503	Endocrinology: human physiology II	6	Pass in BIOL2103 Biological sciences laboratory course	Υ	N	2	May	120	Prof B K C Chow, Biological Sciences				
BIOL3505	Oyster aquaculture and restoration	6	Pass in BIOL2103 Biological sciences laboratory course or BIOL2306 Ecology and evolution or BIOL3301 Marine biology or BIOL3303 Conservation ecology	Y	Y	2	No Exam	20	Dr T Vengatesen, Biological Sciences				
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.	Y	Y	2	No exam	20	Dr L Karczmarski, Biological Sciences				Major in Ecology & Biodiversity (2015,2014,2013,2012)

Course Code	Title C	Credit	Pre-requisite	Avail	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quot	a Course Coordinator		Major / Mi (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer	2010 2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	Biological Sciences (Cont'd)												
BIOL3991	Directed studies in ecology & biodiversity	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.	Y	Y	0	No exam		Prof G A Williams, Biological Sciences				Major in Ecology & Biodiversity (2015,2014,2013,2012)
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	0	No exam		Prof H Corke, Biological Sciences				Major in Food & Nutritional Science (2015,2014,2013,2012)
BIOL3993	Directed studies in Molecular biology & biotechnology	6	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Molecular Biology & Biotechnology Major. This capstone course is for Molecular Biology & Biotechnology Major students The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	0	No exam		Dr W K Yip, Biological Sciences				Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)
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	0	No exam		Dr J S H Tsang, Biological Sciences				Major in Biological Science (2015,2014,2013,2012)
BIOL4201	Public health nutrition	6	Pass in BIOL3201 Food chemistry or BIOL3202 Nutritional biochemistry	Y	Y	2	May	90	Dr J M F Wan, Biological Sciences		Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012)		
BIOL4204	Diet, brain function and behavior	6	Pass in BIOL3204 Nutrition and the life cycle or already enrolled in this course	N	Y			40	Dr E T S Li, Biological Sciences		Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012)		
BIOL4205	Food processing and engineering	6	Pass in BIOL3201 Food chemistry	Y	Y	1	Dec	60	Dr J C Y Lee, Biological Sciences		Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012)		
BIOL4207	Meat and dairy sciences	6	Pass in BIOL3201 Food chemistry	Y	Y	2	May	50	Prof N P Shah, Biological Sciences		Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012)		

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	Biological Sciences (Cont'd)												
	Functional foods		Pass in BIOL3201 Food chemistry or BIOL3202 Nutritional biochemistry	Y	Y	1	Dec	40	Dr M F Wang, Biological Sciences		Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012); Minor in Plant Science (2015,2014,2013,2012)		
BIOL4210	Food product development	6	Pass in BIOL3203 Food microbiology or BIOL4205 Food processing and engineering	Y	Y	1	No exam	40	Dr M F Wang, Biological Sciences		Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012)		
3IOL4301	Fish and fisheries	6	Pass in BIOL3301 Marine biology or BIOL3303 Conservation ecology	Y	Y	2	May	30	Prof Y J Sadovy, Biological Sciences		Major in Biological Sciences (2015,2014,2013,2012); Major in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Marine Biology (2015,2014,2013,2012)		
BIOL4302	Environmental impact assessment	6	Pass in BIOL2103 Biological sciences laboratory course or BIOL2306 Ecology and evolution; and Any BIOL3XXX course or ENVS3004 Environment, society and economics	Y	Y	2	May	30	Dr D M Baker, Biological Sciences		Major in Ecology & Biodiversity (2015,2014,2013,2012); Major in Environmental Science (2015,2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Environmental Science		
3IOL4303	Animal behaviour	6	Pass in BIOL2306 Ecology and evolution; and pass in one of the following courses: BIOL3301 Marine biology or BIOL3313 Freshwater ecology or BIOL3319 Terrestrial ecology or BIOL3320 The biology of marine mammals	N	Y			30	Dr L Karczmarski, Biological Sciences		(2015.2014.2013.2012) Major in Ecology & Biodiversity (2015,2014,2013,2012); Minor in Ecology & Biodiversity (2015,2014,2013,2012)		
BIOL4401	Medical microbiology and applied immunology	6	Pass in BIOL3401 Molecular biology or BIOL3403 Immunology	Y	Y	2	May	40	Dr W Y Lui, Biological Sciences		Major in Biological Sciences (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012)		
	Microbial biotechnology		Pass in BIOL3401 Molecular biology	Y	Y	2	May		Dr J S H Tsang, Biological Sciences	Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)	Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012)		
IOL4409	General virology	6	Pass in BIOL3401 Molecular biology or BIOL3403 Immunology	Y	Y	1	Dec	30	Dr W B L Lim, Biological Sciences		Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)		

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						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	Biological Sciences (Cont'd)												
BIOL4411	Plant and food biotechnology	6	Pass in BIOL3401 Molecular biology or BIOL3211 Nutrigenomics	Y	Y	1	Dec	80	Prof M L Chye, Biological Sciences	Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)	Major in Food & Nutritional Science (2015,2014,2013,2012); Minor in Food & Nutritional Science (2015,2014,2013,2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Plant Science (2015,2014,2013,2012)		
BIOL4415	Healthcare biotechnology	6	Pass in BIOL3401 Molecular biology	Y	Y	2	May	70	Prof A S T Wong, Biological Sciences	Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)	Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012)		
BIOL4416	Stem cells and regenerative biology	6	Pass in BIOL3211 Nutrigenomics or BIOL3401 Molecular biology or BIOL3402 Cell biology and cell technology or BIOL3403 Immunology or BIOL3404 Protein structure and function or BIOL3408 Genetics or BIOC3601 Metabolism or BIOC3604 Essential techniques in biochemistry and molecular biology.	Y	Y	2	May	40	Dr K W Y Yuen, Biological Sciences		Major in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012)		
BIOL4417	'Omics' and systems biology	6	Pass in BIOL3211 Nutrigenomics or BIOL3401 Molecular biology or BIOL3402 Cell biology and cell technology or BIOL3404 Protein structure and function or BIOL3408 Genetics or BIOC3601 Metabolism or BIOC3604 Essential techniques in biochemistry and molecular biology.	Y	Y	2	May	40	Dr J W Zhang, Biological Sciences		Major in Biochemistry (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Biochemistry (2015,2014,2013,2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012)		
BIOL4501	Molecular phylogenetics and evolution	6	Pass in BIOL3401 Molecular biology or BIOL3408 Genetics	N	Υ			25	TBC, Biological Sciences		(200,200,000,000,000,000,000,000,000,000		
BIOL4861	Ecology & biodiversity internship	6	This course is for Ecology & Biodiversity Major students only. The earliest that a student is allowed to take this course is their year 3 study.	Y	Y	1, 2, S	No exam		Dr T Vengatesen, Biological Sciences		Major in Ecology & Biodiversity (2015,2014,2013,2012)		
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 including BIOL3303 Conservation ecology. 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.	Y	Y	S	No exam	15	Prof Y J Sadovy, Biological Sciences				Major in Ecology & Biodiversity (2015,2014,2013,2012)
BIOL4912	Sensory evaluation of food	6	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Food & Nutrional Science Major including BIOL3201 Food Chemistry 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.	Y	Y	2	No exam	20	Prof H Corke, Biological Sciences				Major in Food & Nutritiona Science (2015,2014,2013,2012)

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						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
School of	Biological Sciences (Cont'd)												
BIOL4962	Food & nutritional science internship	6	Pass in at least 24 credits of advanced level disciplinary corre/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 (2015,2014,2013,2012)
BIOL4963	Molecular biology & biotechnology internship	6	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Molecular Biology & Biotechnology Major. This capstone course is for Molecular Biology & Biotechnology Major students 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 W K Yip, Biological Sciences				Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)
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 J S H Tsang, Biological Sciences				Major in Biological Sciences (2015,2014,2013,2012)
BIOL4991	Ecology & biodiversity project	12	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Ecology & Biodiversity Major; and Cumulative GPA of 3.0 or above. Students are not permitted to take both BIOL3991 and BIOL4991. 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.	Y	Y	0	No exam		Prof G A Williams, Biological Sciences				Major in Ecology & Biodiversity (2015,2014,2013,2012)
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		Prof N P Shah, Biological Sciences				Major in Food & Nutritional Science (2015,2014,2013,2012)
BIOL4993	Molecular biology & biotechnology project	12	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses (BIOL3XXX or BIOL4XXX) in the Molecular Biology & Biotechnology Major; and Cumulative GPA of 3.0 or above. This capstone course is for Molecular Biology & Biotechnology Major students The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	0	No exam		Dr W K Yip, Biological Sciences				Major in Molecular Biology & Biotechnology (2015,2014,2013,2012)

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						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
School of E	Biological Sciences (Cont'd)												
3IOL4994	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	Y	Y	0	No exam		Dr J S H Tsang, Biological Sciences				Major in Biological Science (2015,2014,2013,2012)
			this capstone course is their year 3 study.										
ENVS1301	Environmental life science	6	NIL	Y	Y	1	Dec	40	Dr T Vengatesen, Biological Sciences		Major in Environmental Science (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012); Minor in Marine Biology (2015,2014,2013,2012)		
ENVS2001	Environmental field and lab course	6	Pass in ENVS1301 Environmental life science or ENVS1401 Introduction to environmental science or EASC1401 Blue planet or BIOL1309 Evolutionary diversity	Y	Y	1	No exam	30	Dr D M Baker, Biological Sciences	Major in Environmental Science (2015,2014,2013)	Major in Environmental Science (2012); Minor in Environmental Science (2015,2014,2013,2012)		
ENVS2002	Environmental data analysis	6	Pass in ENVS1301 Environmental life science or ENVS1401 Introduction to environmental science or EASC1401 Blue planet or BIOL1309 Evolutionary diversity	Y	Y	2	May	50	Dr T C Bonebrake, Biological Sciences	Major in Ecology & Biodiversity (2015,2014,2013); Major in Environmental Science (2015,2014,2013)	Major in Environmental Science (2012); Minor in Environmental Science (2015,2014,2013,2012)		
ENVS3019	Urban ecology	6	Pass in ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis or BIOL2306 Ecology and evolution	Y	N	1	Dec	50	Dr T C Bonebrake, Biological Sciences		Major in Ecology & Biodiversity (2015,2014,2013,2012); Major in Environmental Science (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
ENVS4110	Environmental remediation	6	Pass in BIOL3109 Environmental microbiology or BIOL3110 Environmental toxicology or BIOL3401 Molecular biology or ENVS3042 Pollution	Y	N	2	May	30	Dr J D Gu, Biological Sciences		Major in Environmental Science (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012); Minor in Molecular Biology & Biotechnology (2015,2014,2013,2012)		
ENVS4955	Environmental science in practice	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	0	No exam	18	Dr M Yasuhara, Biological Sciences		(2013,2014,2013,2012)		Major in Environmental Science (2015,2014,2013,2012)

Course Code	Title	Credi	t Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / N (The Major/Minor that thi		
						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
entre for	Applied English Studies												
CAES1000	Core University English	6	NIL	Y	Y	1, 2	Dec, May		Dr N Fong, English				
AES9820	Academic English for science students	6	NIL	Y	Y	1, 2	No exam		Ms E Law, English				
epartmen	t of Chemistry		<u>'</u>						·	·			
	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.	Y	Y	1	Dec	156	Dr A P L Tong, Chemistry				
CHEM1042	General chemistry I	6	Level 3 or above in HKDSE Chemistry or equivalent; students without Level 3 or above in HKDSE Chemistry but having a pass in CHEM1041 Foundations of chemistry may be allowed to take this course.	Y	Y	1, 2	Dec, May	318	Dr A P L Tong, Chemistry	Major in Biochemistry (2015,2014,2013,2012); Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)	Major in Environmental Science (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
CHEM1043	General chemistry II	6	Pass in CHEM1042 General chemistry I	Y	Y	2	May	180	Dr A P L Tong, Chemistry	Major in Biochemistry (2015); Major in Chemistry (2015); Minor in Chemistry (2015)	Major in Biochemistry (2014,2013,2012)		
CHEM2041	Principles of chemistry	6	Pass in CHEM1042 General chemistry I; and Not for students who have passed in CHEM2341 Inorganic chemistry I or have already enrolled in this course; and Not for students who have passed in CHEM2441 Organic chemistry I or have already enrolled in this course; and Not for students who have passed in CHEM2541 Introductory physical chemistry/Physical chemistry I, or have already enrolled in this course; and	N	Y			140	Dr I K Chu, Chemistry		Major in Environmental Science (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
CHEM2241	Analytical chemistry I	6	Not for Chemistry major students. Pass in CHEM1042 General chemistry I (for students admitted in 2014-15 or before); Pass in CHEM1042 General chemistry I; and Pass in CHEM1043 General chemistry II or already enrolled in this course (for students admitted in 2015-16 or thereafter)	Y	Y	1, 2	Dec, May	115	Dr W T Chan Chemistry	Major in Chemistry (2015,2014,2013,2012)	Major in Environmental Science (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
ÖHEM2341	Inorganic chemistry I	6	Pass in CHEM1042 General chemistry I; and NOT for students who have passed in CHEM2041 Principles of chemistry or already enrolled in this course (for students admitted in 2014-15 or before); Pass in CHEM1042 General chemistry I; and Pass in CHEM1043 General chemistry II or already enrolled in this course; and NOT for students who have passed in CHEM2041 Principles of chemistry or already enrolled in this course (for students admitted in 2015-16 or thereafter)	Y	Y	1, 2	Dec, May	115	Prof V W W Yam (1st sem); Dr H Y Au Yeung (2nd sem) Chemistry		Minor in Chemistry (2015,2014,2013,2012)		

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-	t of Chemistry (Cont'd)												
CHEM2441	Organic chemistry I		Pass in CHEM1042 General chemistry I; and NOT for students who have passed in CHEM2041 Principles of chemistry or already enrolled in this course (for students admitted in 2014-15 or before); Pass in CHEM1042 General chemistry I; and Pass in CHEM1043 General chemistry II or already enrolled in this course; and NOT for students who have passed CHEM2041 Principles of chemistry or already enrolled in this course (for students admitted in 2015-16 or thereafter)	Y	Y	1, 2	Dec, May	200	Prof P Chiu, Chemistry	Major in Biochemistry (2015,2014,2013,2012); Major in Chemistry (2015,2014,2013,2012)	Minor in Chemistry (2015,2014,2013,2012)		
CHEM2442	Fundamentals of organic chemistry	6	Pass in CHEM1042 General chemistry I; and Not for students who have passed CHEM2441 Organic chemistry I or have already enrolled in this course.	Y	Y	1	Dec	130	Dr P H Toy, Chemistry		Major in Environmental Science (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
CHEM2443	Fundamentals of organic chemistry for pharmacy students	6	Pass in CHEM1042 General chemistry I; and Not for students who have passed CHEM2442 Fundamentals of organic chemistry, or already enrolled in this course. (This course is for BPharm students only)	Y	Y	1	Dec	60	Dr P H Toy, Chemistry				
CHEM2541	Introductory physical chemistry		Pass in CHEM1042 General chemistry I; and NOT for students who have passed CHEM2041 Principles of chemistry or already enrolled in this course (for students admitted in 2014-15 or before) Pass in CHEM1042 General chemistry I and CHEM1043 General chemistry II; and NOT for students who have passed CHEM2041 Principles of chemistry or already enrolled in this course (for students admitted in 2015-16 or thereafter)	Y	Y	1, 2	Dec, May	200	Dr J Y Tang, Chemistry	Major in Chemistry (2015,2014,2013,2012)	Major in Biochemistry (2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM3141	Environmental chemistry	6	Pass in CHEM2041 Principles of chemistry or CHEM2341 Inorganic chemistry I or CHEM2441 Organic chemistry I or CHEM2442 Fundamentals of organic chemistry or CHEM2541 Introductory physical chemistry/Physical chemistry I	Y	Y	2	May	100	Dr W T Chan, Chemistry		Major in Chemistry (2014,2013,2012); Major in Environmental Science (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
CHEM3142	Chemical process industries and analysis	6	Pass in CHEM2041 Principles of chemistry or CHEM2341 Inorganic chemistry I or CHEM2441 Organic chemistry I or CHEM2541 Introductory physical chemistry/Physical chemistry I	Y	Y	2	May	60	Prof G K Y Chan, Chemistry		Major in Chemistry (2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		

Course Code	Title	Credi	t Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / M (The Major/Minor that this		
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-	t of Chemistry (Cont'd)								T=				
CHEM3143	Introduction to materials chemistry	6	Pass in CHEM2041 Principles of chemistry or CHEM2341 Inorganic chemistry I or CHEM2441 Organic chemistry I or CHEM2442 Fundamentals of organic chemistry or CHEM2541 Introductory physical chemistry/Physical chemistry I	Y	Y	1	Dec	100	Prof W K Chan, Chemistry		Major in Chemistry (2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM3146	Principles and applications of spectroscopic and analytical techniques	6	Pass in any CHEM2XXX level course	Υ	N	2	May	200	Dr X Li, Chemistry	Major in Chemistry (2014,2013,2012)	Minor in Chemistry (2015,2014,2013,2012)		
CHEM3241	Analytical chemistry II: chemical instrumentation	6	Pass in CHEM2241 Anlytical chemistry I	Y	Y	1	Dec	80	Dr W T Chan, Chemistry	Major in Chemistry (2015,2014,2013,2012)	Major in Environmental Science (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
HEM3242	Food and water analysis	6	Pass in CHEM2041 Principles of chemistry or CHEM2241 Analytical chemistry I or CHEM2341 Inorganic chemistry I or CHEM2341 Organic chemistry I or CHEM2441 Organic chemistry I or CHEM2541 Introductory physical chemistry/Physical chemistry I; and Pass in CHEM3241 Analytical chemistry II: chemical instrumentation, or already enrolled in this course.	Y	Y	2	May	50	Dr K M Ng, Chemistry		Major in Chemistry (2014,2013,2012); Major in Environmental Science (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
CHEM3243	Introductory instrumental chemical analysis	6	Pass in CHEM2041 Principles of chemistry or CHEM2241 Analytical chemistry I; and Not for students who have passed CHEM3241 Analytical chemistry II: chemical instrumentation or have already enrolled in this course.	Y	Y	2	May	65	Dr X Li, Chemistry		Major in Chemistry (2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM3244	Analytical techniques for pharmacy students	6	For BPharm students only; and Pass in BPHM2136 Physical chemistry: principles and applications in pharmaceutical science	Y	Y	2	May	35	Dr X Li, Chemistry		Major in Chemistry (2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM3341	Inorganic chemistry II	6	Pass in CHEM2341 Inorganic chemistry I	Y	Y	1	Dec	90	Prof V W W Yam, Chemistry	Major in Chemistry (2015,2014,2013,2012)	Minor in Chemistry (2015,2014,2013,2012)		
CHEM3342	Bioinorganic chemistry	6	Pass in CHEM2341 Inorganic chemistry I	Y	Y	2	May	50	Prof H Z Sun, Chemistry		Major in Chemistry (2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
≻HEM3441	Organic chemistry II	6	Pass in CHEM2441 Organic chemistry I [Remarks: CHEM3441 Organic chemistry II will be 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	80	Prof D Yang, Chemistry	Major in Chemistry (2015,2014,2013,2012)	Major in Biochemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM3442	Organic chemistry of biomolecules	6	Pass in CHEM2442 Fundamentals of organic chemistry or CHEM2443 Fundamentals of organic chemistry for pharmacy students or CHEM3441 Organic chemistry II	Y	Y	1	Dec	50	Dr P H Toy, Chemistry		Major in Chemistry (2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		

Course Code	Title	Credi	t Pre-requisite	Avail	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	a Course Coordinator		Major / M (The Major/Minor that thi		
						0=year long 1=1st sem 2=2nd sem S=Summer	20.0 20.0		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	of Chemistry (Cont'd)												
CHEM3443	Organic chemistry laboratory	6	Pass in CHEM2441 Organic chemistry I; and pass in CHEM3441 Organic chemistry II 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 Organic chemistry I or CHEM2442 Fundamentals of organic chemistry or CHEM2443 Fundamentals of organic chemistry for pharmacy students; and Pass in CHEM3441 Organic chemistry II or CHEM3442 Organic chemistry II or CHEM3442 Organic chemistry of	Y	Y	2	May	80	Dr A M Y Yuen, Chemistry	Major in Chemistry (2015)	Major in Chemistry (2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
0115140544	Dhorian al anaiste a		biomolecules or already enrolled in any of these two courses (for students admitted in 2015-16 or thereafter)	V	V		D	00	Dect 4.0.0 Observe	Marian in Observation	Minoria Observito		
UHEM3541	Physical chemistry: Introduction to quantum chemistry	6	Pass in CHEM2541 Introductory physical chemistry/Physical chemistry I	Y	Y	1	Dec	80	Prof A S C Cheung, Chemistry	Major in Chemistry (2015,2014,2013,2012)	Minor in Chemistry (2015,2014,2013,2012)		
CHEM3542	Physical chemistry: statistical thermodynamics and kinetics theory	6	Pass in CHEM2541 Introductory physical chemistry/Physical chemistry I	Y	Y	2	May	40	Dr H Hu, Chemistry		Major in Chemistry (2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
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 Inorganic chemistry I or CHEM2441 Organic chemistry I or CHEM2442 Fundamentals of organic chemistry or CHEM2541 Introductory physical chemistry/Physical chemistry I or CHEM3146 Principles and applications of spectroscopic techniques. This capstone course is for Chemistry Major students only.	Y	Y	2	No exam		Prof D L Phillips, Chemistry		Minor in Chemistry (2015,2014,2013,2012)		Major in Chemistry (2015,2014,2013,2012)
			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.										
CHEM4142	Symmetry, group theory and applications	6	Pass in CHEM3341 Inorganic chemistry II	Y	Y	1	Dec	60	Prof V W W Yam, Chemistry		Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM4143	Interfacial science and technology	6	Pass in CHEM3541 Physical chemistry: introduction to quantum chemistry/Physical chemistry II: introduction to quantum chemistry	Y	N	2	May	50	Prof G K Y Chan, Chemistry		Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM4144	Advanced materials		Pass in CHEM3143 Introduction to materials chemistry	Y	Y	2	May	50	Chemistry		Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM4145	Medicinal chemistry	6	Pass in CHEM3441 Organic chemistry II or CHEM3442 Organic chemistry of biomolecules	Y	Y	2	May	70	Prof H Z Sun, Chemistry		Major in Biochemistry (2015,2014,2013,2012); Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		

Course Code	Title	Credi	t Pre-requisite	Avail	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / M (The Major/Minor that this		
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Departmen	t of Chemistry (Cont'd)												
	Modern chemical instrumentation and applications		Pass in CHEM3241 Analytical chemistry II: chemical instrumentation	Y	Y	1	Dec	50	Dr I K Chu, Chemistry		Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM4242	Analytical chemistry	6	Pass in CHEM3241 Analytical chemistry II: chemical instrumentation or CHEM3242 Food and water analysis	Y	Y	2	May	50	Dr K M Ng, Chemistry		Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM4341	Advanced inorganic chemistry	6	Pass in CHEM3341 Inorganic chemistry II	Y	Y	1	Dec	60	Prof C M Che, Chemistry		Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM4342	Organometallic chemistry	6	Pass in CHEM3341 Inorganic chemistry II	Y	Y	1	Dec	40	Prof V W W Yam, Chemistry		Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM4441	Advanced organic chemistry	6	Pass in CHEM3441 Organic chemistry II; or	Y	Y	1	Dec	80	Prof D Yang, Chemistry		Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM4443	Integrated organic synthesis	6	Pass in CHEM3441 Organic chemistry II This capstone course is for Chemistry Major students only.	Y	Y	2	May	50	Prof P Chiu, Chemistry		Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM4444	Chemical biology	6	Pass in CHEM3441 Organic chemistry II or BIOC3601 Metabolism	Y	Y	2	May	50	Dr X C Li, Chemistry		Major in Biochemistry (2015,2014,2013,2012); Major in Chemistry (2015,2014,2013,2012); Minor in Biochemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM4541	Physical chemistry III: statistical thermodynamics and kinetics theory	6	Pass in CHEM3541 Physical chemistry: introduction to quantum chemistry/Physical chemistry II: introduction to quantum chemistry	N	N			40	Dr H Hu, Chemistry		Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM4542	Computational chemistry	6	Pass in PHYS3351 Quantum mechanics or CHEM3541 Physical chemistry: introduction to quantum chemistry/Physical chemistry II: introduction to quantum chemistry.	N	Y			60	Prof G H Chen, Chemistry		Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
CHEM4543	Advanced physical chemistry	6	Pass in CHEM3541 Physical chemistry: introduction to quantum chemistry/Physical chemistry II: introduction to quantum chemistry	Y	Y	2	May	40	Prof G H Chen, Chemistry		Major in Chemistry (2015,2014,2013,2012); Minor in Chemistry (2015,2014,2013,2012)		
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 Analytical chemistry II: chemical instrumentation; and CHEM3341 Inorganic chemistry II; and CHEM3441 Organic chemistry II; and CHEM3541 Physical chemistry: introduction to quantum chemistry/Physical chemistry II: introduction to quantum chemistry. 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	2	No exam		Dr X Li, Chemistry		Minor in Chemistry (2015,2014,2013,2012)		Major in Chemistry (2015,2014,2013,2012)

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / Mi (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
-	nt of Chemistry (Cont'd)		T			_							
CHEM4911	Capstone experience for chemistry undergraduates: HKUtopia	6	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.		Y	S	No exam		Dr A P L Tong, Chemistry		Minor in Chemistry (2015,2014,2013,2012)		Major in Chemistry (2015,2014,2013,2012)
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 students only. The earliest that a student is allowed to take		Y	2, S	No exam		Dr H Y Au-Yeung, Chemistry		Minor in Chemistry (2015,2014,2013,2012)		Major in Chemistry (2015,2014,2013,2012)
			this capstone course is their year 3 study.										
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 Analytical chemistry II: chemistry instrumentation, and CHEM3341 Inorganic chemistry II, and CHEM3341 Organic chemistry II, and CHEM3541 Physical chemistry; introduction to quantum chemistry/Physical chemistry II: introduction to quantum chemistry. 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	0	No exam		Dr J Y Tang, Chemistry		Minor in Chemistry (2015,2014,2013,2012)		Major in Chemistry (2015,2014,2013,2012)
	Practical Chinese for science	6	NIL	Υ	Υ	1, 2	Dec, May		Mr K W Wong,				
JJ013001	students		TVIE	'	_ '	1, 2	Dec, iviay		Chinese				
Departmen	t of Earth Sciences												
	Introduction to climate science		NIL	Y	Y	2	May		Dr Z H Liu, Earth Sciences		Minor in Environmental Science (2015,2014,2013); Major in Environmental Science (2015,2014,2013,2012)		
ASC1401	Blue Planet	6	NIL	Y	Y	1, 2	Dec, May		Dr P Bach, Earth Sciences	Major in Earth System Science (2015,2014,2013,2012)	Major in Environmental Science (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / M (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
•	t of Earth Sciences (Cont'd)												
EASC1402	Principles of geology	6	NIL	Y	Y	1	Dec		Prof M Sun, Earth Sciences	Major in Earth System Science (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012)	Minor in Earth Sciences (2015,2014,2013,2012)		
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	Dr K H Lemke, Earth Sciences				
EASC1405	Peaceful use of nuclear technologies	6	NIL	Y	Y	1	Dec		Dr S H Li, Earth Sciences				
EASC2401	Fluid/solid interactions in earth processes	6	Pass in EASC1401 Blue planet or EASC1402 Principles of geology	Y	Y	2	May		Dr K H Lemke, Earth Sciences	Major in Earth System Science (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012)	Minor in Earth Sciences (2015,2014,2013,2012)		
EASC2402	Field methods	6	Pass in EASC1401 Blue planet or EASC1402 Principles of geology	Y	Y	1	Dec		Dr P Bach, Earth Sciences	Major in Earth System Science (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012)			
EASC2404	Introduction to atmosphere and hydrosphere	6	Pass in EASC1401 Blue planet or EASC1402 Principles of geology	Y	Y	1	Dec	50	Dr J R Ali, Earth Sciences	Major in Earth System Science (2015,2014,2013,2012)	Major in Environmental Science (2012); Minor in Environmental Science (2015,2014,2013,2012)		
ASC2406	Geochemistry	6	Pass in EASC1402 Principles of geology	Υ	Υ	1	Dec		Dr S H Li, Earth Sciences	Major in Geology (2015,2014,2013,2012)			
EASC2407	Mineralogy	6	Pass in EASC1402 Principles of geology	Y	Y	1	Dec	30	Prof M Sun, Earth Sciences	Major in Geology (2015,2014,2013,2012)			
EASC2408	Planetary geology	6	Pass in EASC1401 Blue planet or EASC1402 Principles of geology or PHYS1650 Nature of the universe	Υ	Y	2	May		Dr M H Lee, Earth Sciences	Major in Astronomy (2015,2014,2013,2012)			
EASC2409	Regional field studies	6	Pass in EASC1401 Blue planet or EASC1402 Principles of geology and consent of course coordinator	Y	Y	1	No exam	40	Dr J R Ali, Earth Sciences				
EASC3020	Global change: anthropogenic impacts	6	Pass in EASC2404 Introduction to atmosphere and hydrosphere or ENVS2001 Environmental field and lab course	N	Y				Dr Z H Liu, Earth Sciences		Major in Environmental Science (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
EASC3402	Petrology	6	Pass in EASC2407 Mineralogy	Y	Y	2	May		Prof G Zhao, Earth Sciences	Major in Geology (2015,2014,2013,2012)	Minor in Earth Sciences (2015,2014,2013,2012)		
EASC3403	Sedimentary environments	6	Pass in EASC2402 Field methods or EASC3402 Petrology	Y	Y	2	May		Dr S C Chang, Earth Sciences	Major in Geology (2015,2014,2013,2012)	Major in Earth System Science (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		
EASC3404	Structural geology	6	Pass in EASC2402 Field methods and EASC3402 Petrology	Y	Y	1	Dec	40	Dr J R Ali, Earth Sciences	Major in Geology (2015,2014,2013,2012)	Minor in Earth Sciences (2015,2014,2013,2012)		

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						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
•	t of Earth Sciences (Cont'd)		Descrip DIOLOGOO Feet						TDO		Materia Foot 0 4		
	Environmental remote sensing		Pass in BIOL2306 Ecology and evolution or EASC2404 Introduction to atmosphere and hydrosphere or ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis	N	Y			25	TBC, Earth Sciences		Major in Earth System Science (2015,2014,2013,2012); Major in Environmental Science (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
EASC3406	Reconstruction of past climate	6	Pass in EASC2401 Fluid/solid interactions in earth processes	Y	N	2	May		Dr S H Li, Earth Sciences		Major in Earth System Science (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		
EASC3408	Geophysics	6	Pass in EASC2401 Fluid/solid interactions in earth processes or EASC2402 Field methods or PHYS2250 Introductory mechanics	Y	Y	2	May		Prof P P C Wu, Earth Sciences	Major in Geology (2015,2014,2013,2012)	Major in Earth System Science (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		
EASC3409	Igneous and metamorphic petrogenesis	6	Pass in EASC3402 Petrology	Y	Y	2	May	30	Prof M Sun, Earth Sciences	Major in Geology (2015,2014,2013,2012)	Minor in Earth Sciences (2015,2014,2013,2012)		
EASC3410	Hydrogeology	6	Pass in EASC2402 Field methods	Y	Y	1	Dec	40	Prof J J Jiao, Earth Sciences		Major in Earth System Science (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		
EASC3412	Earth resources	6	Pass in EASC2402 Field methods or EASC3402 Petrology	Y	Y	1	Dec	40	Prof M F Zhou, Earth Sciences		Major in Earth System Science (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		
EASC3413	Engineering geology	6	Pass in EASC3410 Hydrogeology, or already enrolled in this course. This course is only for final year students	Y	Y	2	May	40	Prof J J Jiao, Earth Sciences		Major in Geology (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		
ASC3414	Soil and rock mechanics	6	Pass in EASC3410 Hydrogeology, or already enrolled in this course	Y	Y	2	May	40	Prof J J Jiao, Earth Sciences		Major in Geology (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		
:ASC3415	Meteorology	6	Pass in EASC2404 Introduction to atmosphere and hydrosphere	Y	Y	1	Dec		Dr Z H Liu, Earth Sciences		Major in Earth System Science (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		
:ASC3416	Advanced geochemistry and geochronology	6	Pass in EASC2401 Fluid/solid interactions in earth processes or EASC2406 Geochemistry or EASC2407 Mineralogy	N	Y			50	Prof M F Zhou, Earth Sciences		Major in Earth System Science (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		

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						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	t of Earth Sciences (Cont'd)												
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 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		Prof M Sun, Earth Sciences		Major in Earth System Science (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		
EASC4403	Biogeochemical cycles	6	Pass in ENVS3313 Environmental oceanography or EASC3403 Sedimentary environments or EASC3416 Advanced geochemistry and geochronology	Y	Y	1	Dec		Dr Y Li, Earth Sciences	Major in Earth System Science (2015,2014,2013,2012)	Major in Geology (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		
EASC4406	Earth dynamics & global tectonics	6	Pass in EASC3403 Sedimentary environments or EASC3404 Structural geology or EASC3408 Geophysics or EASC3409 Igneous and metamorphic petrogenesis	Y	Y	2	May		Prof G Zhao, Earth Sciences	Major in Geology (2015,2014,2013,2012)	Minor in Earth Sciences (2015,2014,2013,2012)		
EASC4407	Regional geology	6	Pass in EASC3403 Sedimentary environments or EASC3404 Structural geology or EASC3409 Igneous and metamorphic petrogenesis	Y	Y	1	Dec	40	Dr J R Ali, Earth Sciences		Major in Geology (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		
EASC4408	Special topics in earth sciences	6	Pass in any EASC3XXX or EASC4XXX course	N	Y				TBC, Earth Sciences		Major in Earth System Science (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		
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 Hydrogeology; EASC3415 Meteorology; ENVS3313 Environmental oceanography. 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 Y Li, Earth Sciences		Minor in Earth Sciences (2015,2014,2013,2012)	Major in Earth System Science (2015,2014,2013,2012)	
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. This must include either a PASS in, or student must be already enrolled in EASC3403 Sedimentary environments, EASC3404 Structural geology, EASC3409 Igneous and metamorphic petrogenesis. This capstone course is for Geology 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	36	Dr J A King, Earth Sciences		Minor in Earth Sciences (2015,2014,2013,2012)	Major in Geology (2015,2014,2013,2012)	

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						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2016		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
•	t of Earth Sciences (Cont'd)		I=						T				
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.	Y	Y	2, S	No exam		Dr X R Zuo, Earth Sciences		Minor in Earth Sciences (2015,2014,2013,2012)		
			The earliest that a student is allowed to take this course is their year 3 study.										
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.	Y	Y	0	No exam		Prof M Sun, Earth Sciences		Major in Earth System Science (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012); Minor in Earth Sciences (2015,2014,2013,2012)		
			The earliest that a student is allowed to take this course is their year 3 study.										
ENVS1401	Introduction to environmental science	6	NIL	Y	Y	1	Dec		Dr C Dingle, Earth Sciences	Major in Environmental Science (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)			
NVS3004	Environment, society and economics	6	Pass in one of the following: CHEM2041 Principles of chemistry, EASC2404 Introduction to atmosphere and hydrosphere, ENVS2001 Environmental field and lab course, and ENVS2002 Environmental data analysis	Y	Y	1	Dec		Prof Y Q Zong, Earth Sciences	Major in Environmental Science (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)			
NVS3007	Natural hazards and mitigation	6	Pass in EASC2404 Introduction to atmosphere and hydrosphere or ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis	N	Y				Prof Y Q Zong, Earth Sciences		Major in Earth System Science (2015,2014,2013,2012); Major in Environmental Science (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
ENVS3020	Global change ecology	6	Pass in ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis or BIOL2306 Ecology and evolution	N	Y			50	Dr C Dingle, Earth Sciences		Major in Environmental Science (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
ENV\$3042	Pollution	6	Pass in CHEM1042 General chemistry I; and Pass in ENVS1401 Introduction to environmental science or BIOL1110 From molecules to cells or ENVS1301 Environmental life science; and CHEM2041 Principles of chemistry or CHEM2442 Fundamentals of organic chemistry or ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis	Y	Y	2	No exam	40	Dr B Thibodeau, Earth Sciences		Major in Environmental Science (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		

Course Code	Title	Credi	Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quot	a Course Coordinator		Major / M (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer	2010 2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	t of Earth Sciences (Cont'd)	_	T=			_							
	Environmental oceanography		Pass in ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis or BIOL2306 Ecology and evolution or EASC2404 Introduction to atmosphere and hydrosphere	Y	Y	2	May		Dr C A Not, Earth Sciences	Minor in Marine Biology (2015,2014,2013,2012)	Major in Earth System Science (2015,2014,2013,2012); Major in Environmental Science (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
	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.	Y	Y	0	No exam		Dr C Dingle, Earth Sciences				Major in Environmental Science (2015,2014,2013,2012)
			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.										
	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.	Y	Y	1, 2, S	No exam		Dr C Dingle, Earth Sciences				Major in Environmental Science (2015,2014,2013,2012)
			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.										
	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;	Υ	Y	0	No exam		Prof Y Q Zong, Earth Sciences				Major in Environmental Science (2015,2014,2013,2012)
			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.										
epartmen	t of Mathematics												
	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 University mathematics I or MATH1013 University mathematics II, or have already enrolled in these courses. This course is exclusively for non-Science	Y	Y	1, 2	Dec, May	380	Dr Y M Chan (1st sem); Dr K H Law (2nd sem), Mathematics				
			and non-Engineering students (i.e. not for students from the Faculty of Science or Engineering).										

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / Mi (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
•	t of Mathematics (Cont'd)												
MATH1011	University mathematics I	6	NIL The course has no pre-requisite, but students are expected to have achieved Level 2 or above in HKDSE Mathematics or equivalent before enrolling the course; and Not for students with Level 2 or above in Module 1 or Module 2 of HKDSE Mathematics or equivalent.	Y	Y	1, 2	Dec, May		Dr H Y Zhang, Mathematics				
	University mathematics II		Level 2 or above in Module 1, or Module 2 of HKDSE Mathematics or equivalent, or Pass in MATH1011 University mathematics I; and Not for students who have passed MATH1821 Mathematical methods for actuarial science I, or (MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics), or have already enrolled in this course.	Y	Y	1, 2	Dec, May	650	Dr C W Wong (1st sem); Dr Y M Chan (2nd sem), Mathematics	Major in Decision Analytics (2015,2014,2013,2012); Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012); Minor in Computational & Financial Mathematics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)	Minor in Actuarial Studies (2015,2014,2013,2012)		
MATH1641	Mathematical laboratory and modeling	6	NIL	N	N			20	TBC, Mathematics				
MATH1821	Mathematical methods for actuarial science I		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 University mathematics II or (MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, Probability and statistics), or have already enrolled in these courses. For BSc(ActuarSc) students only.	Y	Y	1	Dec		Dr J T Chan, Mathematics	BSc in Actuarial Science (2015,2014,2013,2012)			
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 University mathematics I (This course is exclusively for Engineering students.)	Y	Y	1, 2	Dec, May	640	Prof K M Tsang (1st sem); Dr Y K Lau (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 University Mathematics I. (This course is exclusively for Engineering students.)	Y	Y	1, 2	Dec, May	640	Dr G Han, Mathematics				
MATH2012	Fundamental concepts of mathematics	6	Pass in MATH1013 University mathematics II or MATH1821 Mathematical methods for actuarial science I or (MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics).	Y	Y	1, 2	Dec, May		Dr Y M Chan, Mathematics	Major in Mathematics (2015,2014,2013,2012)			

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quot	a Course Coordinator		Major / M (The Major/Minor that thi		
						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
•	t of Mathematics (Cont'd)												
	Multivariable calculus and linear algebra		Pass in MATH1013 University mathematics II or (MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics). Not for students who have passed MATH2822 Mathematical methods for actuarial science II or ((MATH2101 Linear algebra I or MATH2102 Linear algebra II) and MATH2211 Multivariable calculus), or have already enrolled in these courses.	Y	Y	1, 2	Dec, May		Dr H Y Zhang, Mathematics	Major in Risk Management (2015,2014); Major in Statistics (2015,2014); Major in Decision Analytics (2015,2014,2013,2012)			
MATH2101	Linear algebra I	6	Pass in MATH1013 University mathematics II or MATH1821 Mathematical methods for actuarial science I or (MATH1851 calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics).	Y	Y	1, 2	Dec, May		Dr K H Law, Mathematics	Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Computational & Financial Mathematics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)			
MATH2102	Linear algebra II		Pass in MATH2101 Linear algebra I or (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II).	Y	Y	2	May		Prof W Zang, Mathematics	Major in Mathematics (2015,2014,2013,2012)			
MATH2211	Multivariable calculus	6	Pass in MATH1013 University mathematics II or MATH1821 Mathematical methods for actuarial science I or (MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics).	Y	Y	1, 2	Dec, May		Dr Z Hua (1st sem); Dr C W Wong (2nd sem), Mathematics	Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Computational & Financial Mathematics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)			
MATH2241	Introduction to mathematical analysis	6	Pass in MATH1013 University mathematics II or (MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics) or MATH2822 Mathematical methods for actuarial science II. Students are strongly recommended to have taken MATH2012 Fundamental concepts of mathematics if they wish to take this course.	Y	Y	1, 2	Dec, May		Dr B Kane (1st sem); Prof N Mok (2nd sem), Mathematics	Major in Mathematics (2015,2014,2013,2012)			
MATH2822	Mathematical methods for actuarial science II	6	Pass in MATH1821 Mathematical methods for actuarial science I. For BSc(ActuarSc) students only.	Y	Y	2	May		Dr J T Chan, Mathematics	BSc in Actuarial Science (2015,2014,2013,2012)			
MATH3001	Development of mathematical ideas	6	Pass in MATH2101 Linear algebra I, MATH2102 Linear algebra II, MATH2211 Multivariable calculus and MATH2241 Introduction to mathematical analysis.	N	N				Prof W K Ching, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		

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						0=year long 1=1st sem 2=2nd sem S=Summer	2010 2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
-	t of Mathematics (Cont'd)												
	Mathematics seminar		Pass in MATH2012 Fundamental concepts of mathematics, MATH2101 Linear algebra I, MATH2211 Multivariable calculus and MATH2241 Introduction to mathematical analysis. (This course is for second year BSc students only.)	N	N			12	Prof T W Ng, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH3301	Algebra I	6	Pass in MATH2101 Linear algebra I.	Y	Y	1	Dec		Dr Y K Lau, Mathematics	Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012)	Minor in Mathematics (2015,2014,2013,2012)		
MATH3303	Matrix theory and its applications	6	Pass in MATH2101 Linear algebra I and MATH2102 Linear algebra II.	N	Y				Dr M Young, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH3304	Introduction to number theory	6	Pass in MATH2101 Linear algebra I and MATH2211 Multivariable calculus.	Y	Y	2	May		Prof K M Tsang, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH3401	Analysis I	6	Pass in MATH2211 Multivariable calculus.	Y	Y	1	Dec		Prof W S Cheung, Mathematics	Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012)	Minor in Mathematics (2015,2014,2013,2012)		
MATH3403	Functions of a complex variable	6	Pass in MATH2211 Multivariable calculus and MATH2241 Introduction to mathematical analysis.	Y	Y	1	Dec		Prof T W Ng, Mathematics	Major in Mathematics (2015,2014,2013,2012)	Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH3405	Differential equations	6	Pass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH2014 Multivariable calculus and linear algebra) or (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II).	Y	Y	2	May		Dr C W Wong, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
иАТН3408	Computational methods and differential equations with applications	6	Pass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH2014 Multivariable calculus and linear algebra) or (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II).	Y	N	2	May		Dr C W Wong, Mathematics		Major in Decision Analytics (2015,2014,2013,2012); Major in Environmental Science (2015,2014,2013,2012); Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Computational & Financial Mathematics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		

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						0=year long 1=1st sem 2=2nd sem S=Summer	2010 2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	t of Mathematics (Cont'd) Discrete mathematics	6	Pass in (MATH1013 University mathematics II and any 1 of Level 2 MATH courses) or (MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics and any 1 of level 2 MATH courses) or (MATH2014 Multivariable calculus and linear algebra) or (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science		N	1	Dec		Dr K H Law, Mathematics		Major in Decision Analytics (2015,2014,2013,2012); Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
//ATH3601	Numerical analysis	6	Pass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH2014 Multivariable calculus and linear algebra) or (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II).	Y	Y	1	Dec		Dr Z Zhang, Mathematics	Minor in Computational & Financial Mathematics (2015,2014,2013,2012)	Major in Decision Analytics (2015,2014,2013,2012); Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
1ATH3603	Probability theory	6	Pass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH2014 Multivariable calculus and linear algebra) or (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II).	Y	Y	1	Dec		Dr Z Qu, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Computational & Financial Mathematics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
IATH3901	Operations research I	6	Pass in MATH2014 Multivariable calculus and linear algebra or MATH2101 Linear algebra I or MATH2102 Linear algebra II.	Y	Y	2	May		Dr Z Qu, Mathematics		Major in Decision Analytics (2015,2014,2013,2012); Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
1ATH3904	Introduction to optimization	6	Pass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH2014 Multivariable calculus and linear algebra) or (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II).	Y	Y	2	May		Prof W Zang, Mathematics	Major in Decision Analytics (2015,2014,2013,2012)	Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Computational & Financial Mathematics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
1ATH3905	Queueing theory and simulation	6	Pass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH2014 Multivariable calculus and linear algebra) or (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II).	Y	N	2	May		Dr Z Zhang, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		

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	t of Mathematics (Cont'd) Financial calculus	6	Pass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH2014 Multivariable calculus and linear algebra) or (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II) or STAT2601 Probability and statistics I.	Y	Y	1	Dec		Dr S P Yung, Mathematics	Minor in Computational & Financial Mathematics (2015,2014,2013,2012)	Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH3911	Game theory and strategy	6	Pass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II).	Y	Y	2	May		Dr K H Law, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Computational & Financial Mathematics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH3943	Network models in operations research	6	Pass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH2014 Multivariable calculus and linear algebra); and Pass in MATH3901 Operations research I, or already enrolled in this course.	N	Y				Prof W Zang, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
	Directed studies in mathematics	6	Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX, MATH4XXX or MATH7XXX) in the Mathematics, and Mathematics/Physics Majors, in addition to a pass in MATH2101 Linear algebra I, MATH2102 Linear algebra II, MATH2211 Multivariable calculus and MATH2241 Introduction to mathematical analysis. Subject to approval by the Department. This capstone course is for Mathematics, and Mathematics/Physics Majors students only. The earliest that a student is allowed to take this capstone course is their year 3 study.		Y	1, 2	No exam		Prof W K Ching, Mathematics		Minor in Mathematics (2015,2014,2013,2012)		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012)
MATH4302	Algebra II	6	Pass in MATH3301 Algebra I.	Y	Y	2	May		Prof J H Lu, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH4402	Analysis II	6	Pass in MATH3401 Analysis I.	Y	Y	2	May		Dr M Young, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
VIATH4404	Functional analysis	6	Pass in MATH2101 Linear algebra I, MATH2102 Linear algebra II, MATH2211 Multivariable calculus and MATH2241 Introduction to mathematical analysis and MATH3401 Analysis I.	Y	Y	2	May		Dr J T Chan, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		

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	t of Mathematics (Cont'd) Introduction to partial differential equations	6	Pass in MATH2101 Linear algebra I, MATH2102 Linear algebra II, MATH2241 Introduction to mathematical analysis; and Pass in MATH3405 Differential equations, or already enrolled in this course.	Y	Y	2	May		Dr H Y Zhang, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH4501	Geometry	6	Pass in MATH2101 Linear algebra I and MATH3401 Analysis I.	Y	Y	1	Dec		Dr J Fullwood, Mathematics	Major in Mathematics/Physics (2015,2014,2013,2012)	Major in Mathematics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH4511	Introduction to differentiable manifolds	6	Pass in MATH3401 Analysis I (having taken MATH4501 Geometry would be helpful; the course can also be taken concurrently with MATH4402 Analysis II).	Y	N	2	May		Prof J H Lu, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH4602	Scientific computing	6	Pass in MATH3601 Numerical analysis.	N	Y				Prof W K Ching, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Computational & Financial Mathematics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH4902	Operations research II	6	Pass in MATH2101 Linear algebra I and MATH2211 Multivariable calculus; and Pass in MATH3901 Operations research I, or already enrolled in this course.	N	Y				Dr G Han, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH4907	Numerical methods for financial calculus	6	Pass in MATH3906 Financial calculus or equivalent.	N	Y				TBC, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Computational & Financial Mathematics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH4910	Senior mathematics seminar	6	Pass in at least 24 credits of advanced level disciplinary corre/elective mathematics courses (MATH3XXX, MATH4XXX, or MATH7XXX) in the Mathematics, and Mathematics/Physics Majors including MATH3301 Algebra I, MATH3401 Analysis I, and MATH3403 Functions of a complex variable. Subject to approval by the Department. This capstone course is for Mathematics, and Mathematics/Physics Majors students only. The earliest that a student is allowed to take this capstone course is their year 3 study.		Y			12	Prof T W Ng, Mathematics		Minor in Mathematics (2015,2014,2013,2012)		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012)

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						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	t of Mathematics (Cont'd)												
//ATH4911	Mathematics capstone project	6	Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX, MATH4XXX, or MATH7XXX) in the Mathematics, and Mathematics/Physics Majors.	N	Y				Dr S P Yung, Mathematics		Minor in Mathematics (2015,2014,2013,2012)		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012)
			Subject to approval by the Department. This capstone course is for Mathematics, 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.)										
MATH4966	Mathematics internship	6	Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX, MATH4XXX, or MATH7XXX) in the Mathematics, and Mathematics/Physics Majors.	Y	Y	1, 2, S	No exam		Prof T W Ng, Mathematics		Minor in Mathematics (2015,2014,2013,2012)		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012)
			This capstone course is for Mathematics, and Mathematics/Physics Majors students only. The earliest that a student is allowed to take										
			this capstone course is their year 3 study.										
иАТН4999	Mathematics project	12	Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX, MATH4XXX, or MATH7XXX) in the Mathematics, and Mathematics/Physics Majors including MATH3301 Algebra I, MATH3401 Analysis I, and MATH3403 Functions of a complex variable. Subject to approval by the Department. This capstone course is for Mathematics, and Mathematics/Physics Majors students only. The earliest that a student is allowed to take this capstone course is their year 3 study.	Y	Y	0	No exam		Prof W K Ching, Mathematics		Minor in Mathematics (2015,2014,2013,2012)		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012)
/ATH7101	Intermediate complex analysis	6	Pass in a first course in Complex Analysis such as MATH3403 Functions of a complex variable, and approval by the course coordinator.	Y	Y	1	Dec		Prof N Mok, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
AATH7201	Topics in geometry	6	Pass in (MATH4402 Analysis II or MATH4501 Geometry) and (MATH4511 Introduction to differentiable manifolds or the approval of the course coordinator).	N	Y				Prof W K Ching, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
/ATH7202	Complex manifolds	6	Pass in a first course in Complex Analysis such as MATH3403 Functions of a complex variable, a first course in Differential Geometry such as MATH4501 Geometry, and approval by the course coordinator.	N	N				Prof N Mok, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		

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						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
epartmen	t of Mathematics (Cont'd)												
	Topics in financial mathematics		Pass in an advanced level mathematics courses (MATH3XXX, MATH4XXX, or MATH7XXX) and subject to the approval of the course coordinator.	N	N				Dr J Song, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
	Topics in applied functional analysis	6	Pass in MATH3401 Analysis I and MATH4404 Functional analysis, or approval of the course coordinator.	N	Y				Dr S P Yung, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
	Topics in advanced probability theory	6	Pass in MATH3603 Probability theory and MATH4402 Analysis II and approval of the course coordinator.	Y	N	1	Dec		Dr G Han, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
/ATH7501	Topics in algebra	6	Pass in MATH4302 Algebra II.	Y	N	2	May		Dr Z Hua, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
	Topics in applied discrete mathematics	6	Pass in MATH3301 Algebra I and MATH3600 Discrete mathematics.	N	Y				Prof W Zang, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
	Topics in mathematical programming and optimization	6	Pass in MATH3901 Operations research I, MATH3904 Introduction to optimization and MATH4902 Operations research II.	Y	N	1	Dec		Prof W Zang, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
/ATH7504	Geometric topology	6	Pass in MATH3301 Algebra I and MATH3401 Analysis I.	N	N				Dr Z Hua, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		
MATH7505	Real analysis	6	Pass in MATH3401 Analysis I.	Y	Y	2	May		Prof W S Cheung, Mathematics		Major in Mathematics (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Mathematics (2015,2014,2013,2012)		

Course Code	Title	Credi	t Pre-requisite	Availa	ble in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	a Course Coordinator		Major / (The Major/Minor that th		
						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	t of Physics												
PHYS1050	Physics for engineering students	6	Level 3 or above in HKDSE Physics or Combined Science with Physics components or equivalent (This course is exclusive for Engineering students.)	Y	Y	1, 2	Dec, May		Prof M H Xie, Physics				
PHYS1055	How things work	6	NIL	Y	Y	2	May		Dr M K Yip, Physics				
PHYS1056	Weather and climate	6	NIL	Y	Y	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; Students without Level 3 or above in HKDSE Physics but having a pass in PHYS1240 Physics by inquiry may be allowed to take this course.	Y	Y	2	May		Dr S Z Zhang, Physics	Major in Physics (2015,2014,2013,2012)			
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 Physics for engineering students or already enrolled in this course; and Not for students who have passed in PHYS1250 Fundamental physics or already enrolled in this course.	Y	Y	1	Dec		Dr F K Chow, Physics				
PHYS1250	Fundamental physics	6	Level 3 or above in HKDSE Physics or equivalent; Students without Level 3 or above in HKDSE Physics but having a pass in PHYS1240 Physics by inquiry may be allowed to take this course; Not for students who have passed in PHYS1050 Physics for engineering students or already enrolled in this course.	Y	Y	1, 2	Dec, May		Dr M K Yip, Physics	Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)			
PHYS1650	Nature of the universe	6	NIL	Y	Y	1, 2	Dec, May		Dr K M Lee, Physics	Major in Astronomy (2015,2014,2013,2012); Minor in Astronomy (2015,2014,2013,2012)			
PHYS2055	Introduction to relativity	6	Pass in PHYS1250 Fundamental physics or PHYS1150 Problem solving in physics or PHYS1050 Physics for engineering students	Y	Y	2	May		Dr K M Lee, Physics				
PHYS2150	Methods in physics I	6	Pass in PHYS1150 Problem solving in physics or MATH1011 University mathematics I or MATH1013 University mathematics II or MATH1851 Calculus and ordinary differential equations	Y	Y	1	Dec		Dr F K Chow, Physics				
PHYS2155	Methods in physics II	6	Pass in PHYS1150 Problem solving in physics or MATH1011 University mathematics I or MATH1013 University mathematics II or MATH1851 Calculus and ordinary differential equations	Y	Y	2	May		Dr F C C Ling, Physics				

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Departmen	t of Physics (Cont'd)												
PHYS2250	Introductory mechanics	6	Pass in PHYS1250 Fundamental physics or PHYS1050 Physics for engineering students	Y	Y	1, 2	Dec, May		Dr M K Yip, Physics	Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)			
PHYS2255	Introductory electricity and magnetism	6	Pass in PHYS1250 Fundamental physics or PHYS1050 Physics for engineering students	Y	Y	2	May		Dr J C S Pun, Physics	Major in Astronomy (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012)			
PHYS2260	Heat and waves	6	Pass in PHYS1250 Fundamental physics or PHYS1050 Physics for engineering students		Y	1	Dec		Dr F C C Ling, Physics	Major in Physics (2015,2014,2013,2012)			
PHYS2265	Modern physics	6	Pass in PHYS1250 Fundamental physics or PHYS1050 Physics for engineering students		Y	1, 2	Dec, May		Dr F K Chow, Physics	Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)			
PHYS2850	Atomic and nuclear physics	6	Pass in PHYS2265 Modern physics	N	N				Dr S Z Zhang, Physics				
PHYS3150	Theoretical physics	6	Pass in (PHYS2250 Introductory mechanics or PHYS2255 Introductory electricity and magnetism or PHYS2265 Modern physics) and (PHYS2150 Methods in physics I or MATH2211 Multivariable calculus)	Y	Y	1	Dec		Prof Z D Wang, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS3350	Classical mechanics	6	Pass in PHYS2250 Introductory mechanics	Y	Y	1	Dec		Dr S Z Zhang, Physics	Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012)	Major in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS3351	Quantum mechanics		Pass in PHYS2265 Modern physics	Y	Y	1	Dec		Dr W Yao, Physics	Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012)	Major in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS3450	Electromagnetism	6	Pass in PHYS2255 Introductory electricity and magnetism	Y	Y	2	May		Prof X D Cui, Physics	Major in Physics (2015,2014,2013,2012)	Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / N (The Major/Minor that thi		
						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
Departmen	t of Physics (Cont'd)												
PHYS3550	Statistical mechanics & thermodynamics	6	Pass in PHYS2260 Heat and waves	Y	Y	2	May		Prof M H Xie, Physics	Major in Physics (2015,2014,2013,2012)	Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS3551	Introductory solid state physics	6	Pass in PHYS2260 Heat and waves and PHYS2265 Modern physics	Y	Y	1	Dec		Prof J Gao, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS3650	Observational astronomy	6	Pass in PHYS1650 Nature of the universe and (PHYS2250 Introductory mechanics or PHYS2265 Modern physics)	Y	Y	1	Dec		Dr J J L Lim, Physics	Major in Astronomy (2015,2014,2013,2012)	Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS3651	The physical universe	6	Pass in PHYS1650 Nature of the universe and (PHYS2250 Introductory mechanics or PHYS2265 Modern physics)	Y	Y	1	Dec		Dr S C Y Ng, Physics	Major in Astronomy (2015,2014,2013,2012)	Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS3652	Principles of astronomy	6	Pass in PHYS1650 Nature of the universe and (PHYS2250 Introductory mechanics or PHYS2265 Modern physics)	Y	Y	2	May		Dr J J L Lim, Physics	Major in Astronomy (2015,2014,2013,2012)	Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS3750	Laser and spectroscopy	6	Pass in PHYS3551 Introductory solid state physics, or already enrolled in this course.	Y	Y	1	Dec		Prof S J Xu, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS3751	Physics of nanomaterials	6	Pass in PHYS3351 Quantum mechanics, and Pass in PHYS3551 Introductory solid state physics, or already enrolled in this course.	N	N				TBC, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		

Course Code	Title	Credi	Pre-requisite	Avail	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / M (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	t of Physics (Cont'd) Waves and optics	6	Pass in PHYS2255 Introductory electricity and magnetism and PHYS2260 Heat and waves	Y	Y	2	May		Prof S J Xu, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS3851	Atomic and nuclear physics	6	Pass in PHYS3351 Quantum mechanics	Y	Y	2	May		Dr J H C Lee, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
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, Mathematics/Physics Major or Astronomy Major curriculum. This capstone course is for Astronomy, Mathematics/Physics, and Physics Majors students only. The earliest that a student is allowed to take this capstone course is their year 3 study.		Y	1, 2, S	No exam		Prof J Wang, Physics		Minor in Physics (2015,2014,2013,2012)		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012)
PHYS4150	Computational physics	6	Pass in (PHYS3150 Theoretical physics or MATH3301 Algebra I or MATH3401 Analysis I or MATH3403 Functions of a complex variable or MATH3405 Differential equations); and Pass in any three of the following courses: PHYS3350 Classical mechanics, PHYS3351 Quantum mechanics, PHYS3450 Electromagnetism, PHYS3550 Statistical mechanics and thermodynamics	Y	Y	1	Dec		Prof J Wang, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS4151	Data analysis and modeling in physics	6	Pass in (PHYS3150 Theoretical physics or MATH3301 Algebra I or MATH3401 Analysis I or MATH3403 Functions of a complex variable or MATH3405 Differential equations); and Pass in any one of the following courses: PHYS3350 Classical mechanics, PHYS3351 Quantum mechanics, PHYS3450 Electromagnetism, PHYS3550 Statistical mechanics & thermodynamics	N	Y				Prof H F Chau, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS4350	Advanced classical mechanics	6	Pass in PHYS3350 Classical mechanics	Y	Y	2	May		Prof S Q Shen, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / M (The Major/Minor that this		
				2015- 2016	2016- 2017	0=year long 1=1st sem 2=2nd sem S=Summer	2010 2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	t of Physics (Cont'd)												
PHYS4351	Advanced quantum mechanics	6	Pass in PHYS3351 Quantum mechanics	Y	Y	2	May		Dr W Yao, Physics	Major in Mathematics/Physics (2015,2014,2013,2012)	Major in Astronomy (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS4450	Advanced electromagnetism	6	Pass in PHYS3450 Electromagnetism	Y	Y	1	Dec		Prof X D Cui, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS4550	Advanced statistical mechanics	6	Pass in PHYS3550 Statistical mechanics & thermodynamics	Y	Y	2	May		Dr Y Tu, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS4650	Stellar physics	6	Pass in PHYS3651 The physical universe and PHYS3351 Quantum mechanics	Y	Y	2	May		Dr S C Y Ng, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS4651	Selected topics in astrophysics	6	Pass in PHYS3351 Quantum mechanics or PHYS3450 Electromagnetism or PHYS3550 Statistical mechanics & thermodynamics or PHYS3651 The physical universe	Y	N	1	Dec		Prof K S Cheng, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS4652	Planetary science	6	Pass in PHYS3651 The physical universe or (PHYS3350 Classical mechanics and PHYS3550 Statistical mechanics & thermodynamics)	Y	N	2	May		Dr M H Lee, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		

Course Code	Title	Credi	t Pre-requisite	Avail	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	a Course Coordinator		Major / M (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
•	t of Physics (Cont'd)												
PHYS4653	Cosmology	6	Pass in PHYS3651 The physical universe or PHYS3652 Principles of astronomy	N	Y				Prof K S Cheng, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS4654	General relativity	6	Pass in PHYS2055 Introduction to relativity and PHYS3350 Classical mechanics	Y	N	1	Dec		Dr K M Lee, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS4655	Interstellar medium	6	Pass in PHYS3651 The physical universe or (PHYS3351 Quantum mechanics and PHY3550 Statistical mechanics & thermodynamics)	N	Y				Dr M H Lee, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS4750	Experimental physics	6	TBC	N	N				TBC, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
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, Mathematics/Physics Major or Astronomy Major curriculum. This capstone course is for Astronomy, Mathematics/Physics, and Physics Majors students only. The earliest that a student is allowed to take this capstone course is their year 3 study.		Y	S	No exam		Dr J C S Pun, Physics		Minor in Physics (2015,2014,2013,2012)		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012)
PHYS4999	Physics project	12	Pass in at least 24 credits of advanced level (3XXX level or above) disciplinary core/elective courses of the Physics Major, Mathematics/Physics Major or Astronomy Major curriculum. This capstone course is for Astronomy, Mathematics/Physics, and Physics Majors students only. The earliest that a student is allowed to take this capstone course is their year 3 study.		Y	0	No exam		Prof J Wang, Physics		Minor in Physics (2015,2014,2013,2012)		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012)

Course Code	Title	Credi	Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / Mi (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
epartmen	t of Physics (Cont'd)												
	Graduate classical mechanics		Pass in PHYS4350 Advanced classical mechanics	N	N				TBC, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS7351	Graduate quantum mechanics	6	Pass in PHYS4351 Advanced quantum mechanics	N	Y				Prof S Q Shen, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS7450	Graduate electromagnetism	6	Pass in PHYS4450 Advanced electromagnetism	Y	Y	2	May		Prof Z D Wang, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS7550	Graduate statistical mechanics	6	Pass in PHYS4550 Advanced statistical mechanics	N	Y				Prof J Wang, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS7551	Solid state physics	6	Pass in PHYS3551 Introductory solid state physics and PHYS4351 Advanced quantum mechanics	Y	N	2	May		Prof J Wang, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
PHYS7650	Stellar atmospheres	6	TBC	N	N				TBC, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Astronomy (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		

Course Code	Title	Credi	t Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / M (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
-	t of Physics (Cont'd) Nanophysics	6	Pass in PHYS4351 Advanced quantum mechanics and PHYS3551 Introductory solid state physics	N	N				Prof S J Xu, Physics		Major in Astronomy (2015,2014,2013,2012); Major in Mathematics/Physics (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Minor in Physics (2015,2014,2013,2012)		
:NVS3006	Environmental radiation	6	Pass in PHYS2265 Modern physics or CHEM2041 Principles of chemistry or ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis	N	N				Dr J K C Leung, Physics		Major in Environmental Science (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
:NVS3010	Sustainable energy and environment	6	Pass in PHYS2260 Heat and waves or CHEM2041 Principles of chemistry or ENVS2001 Environmental field and lab course or ENVS2002 Environmental data analysis	Y	Y	2	May		Prof A B Djurisic, Physics		Major in Environmental Science (2015,2014,2013,2012); Minor in Environmental Science (2015,2014,2013,2012)		
aculty of	Science										, , , ,		
ione i i i i	Scientific method and reasoning		NIL (This course is compulsory for all students taking a Science major offered by the Faculty of Science. Students should take this course in their first year.)	Y	Y	1, 2	Dec, May		Dr K F Lam, Statistics & Actuarial Science	Major in Astronomy (2015,2014,2013,2012); Major in Biochemistry (2015,2014,2013,2012); Major in Biological Sciences (2015,2014,2013,2012); Major in Chemistry (2015,2014,2013,2012); Major in Decision Analytics (2015,2014,2013,2012); Major in Earth System Science (2015,2014,2013,2012); Major in Ervironmental Science (2015,2014,2013,2012); Major in Environmental Science (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012); Major in Mathematics (2015,2014,2013,2012); Major in Mathematics (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012)			

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quot	a Course Coordinator		Major / (The Major/Minor that th		
						0=year long 1=1st sem 2=2nd sem S=Summer	2010 2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	Science (Cont'd) Fundamentals of modern science	6	NIL (This course is compulsory for all students taking a Science major offered by the Faculty of Science. Students should take this course in their first year.)	Y	Y	1, 2	Dec, May		Dr J C S Pun, Physics	Major in Astronomy (2015,2014,2013,2012); Major in Biochemistry (2015,2014,2013,2012); Major in Biological Sciences (2015,2014,2013,2012); Major in Chemistry (2015,2014,2013,2012); Major in Decision Analytics (2015,2014,2013,2012); Major in Earth System Science (2015,2014,2013,2012); Major in Erology & Biodiversity (2015,2014,2013,2012); Major in Environmental Science (2015,2014,2013,2012); Major in Food & Nutritional Science (2015,2014,2013,2012); Major in Geology (2015,2014,2013,2012); Major in Mathematics (2015,2014,2013,2012); Major in Mathematics (2015,2014,2013,2012); Major in Molecular Biology & Biotechnology (2015,2014,2013,2012); Major in Physics (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012)			
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	Y	Y	1	No exam	50	Dr W M Y Cheung, Faculty				
6CNC2121	Sustainable food production	6	6901 BSc or 6119 BEd&BSc programmes. 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.	Y	Y	S	No exam	32	Dr H S El-Nezami, Biological Sciences				
6CNC2122	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 need to pass an interview in order to be enrolled in the course.	Y	Y	S	Summer	32	Dr T Vengatesen, Biological Sciences				
CNC3111	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	2	No exam	30	Prof P Chiu, Chemistry				

Course Code	Title	Credi	t Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quot	a Course Coordinator		Major / M (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
-	t of Statistics & Actuarial Scie Statistics: ideas and concepts	_	NIL	Y	Y	1, 2	Dec, May		Dr K P Wat, Statistics & Actuarial Science	Major in Risk Management (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012)			
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 Probability and statistics: foundations of actuarial science, STAT1602 Business statistics, STAT2601 Probability and statistics I, STAT1603 Introductory statistics, ECON1280 Analysis of economic data	Y	Y	2	May		Mrs G M Jing, Statistics & Actuarial Science	Major in Environmental Science (2012)	Major in Environmental Science (2015,2014,2013); Minor in Risk Management (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT1602	Business statistics	6	NIL Not for students who have passed or already enrolled in any of the following courses: STAT1601 Elementary statistical methods, STAT2601 Probability and statistics I, STAT1603 Introductory statistics, STAT2901 Probability and statistics: foundations of actuarial science, ECON1280 Analysis of economic data (This course is exclusive for School of Business students.)	Y	Y	1, 2	Dec, May		Dr R W L Wong, Statistics & Actuarial Science		Minor in Risk Management (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT1603	Introductory statistics	6	(Level 2 or above in HKDSE Mathematics Extended Module 1 or 2 or equivalent) or (Pass in MATH1011 University mathematics I, or already enrolled in this course); and Not for students who have passed or already enrolled in any of these courses: STAT1601 Elementary statistical methods, STAT1602 Business statistics, STAT2601 Probability and statistics I, STAT2901 Probability and statistics: foundations of actuarial science	Y	Y	1	Dec		Dr E K F Lam, Statistics & Actuarial Science	Major in Environmental Science (2012)	Major in Environmental Science (2015,2014,2013); Minor in Risk Management (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT2601	Probability and statistics I	6	Pass or already enrolled in MATH2014 Multivariable calculus and linear algebra, or (MATH2101 Linear algebra I and MATH2211 Multivariable calculus), for students admitted in 2014 or thereafter; or Pass in MATH1013 University mathematics II, or already enrolled in this course, for students admitted in 2013 or before; or Pass in MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics, for students admitted in 2013 or before; and Not for students who have passed in STAT1603 Introductory statistics, or already enrolled in this course; Not for students who have passed in STAT2901 Probability and statistics: foundations of actuarial science, or already enrolled in this course; and Not for BSc(ActuarSc) students.		Y	1, 2	Dec, May		Dr C W Kwan, Statistics & Actuarial Science	Major in Decision Analytics (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012)	Minor in Actuarial Studies (2015,2014,2013,2012); Minor in Risk Management (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		

Course Code	Title	Credi	t Pre-requisite	Avail	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	a Course Coordinator		Major / Mir (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
•	t of Statistics & Actuarial Sci												
	Probability and statistics II		Pass in STAT2601 Probability and statistics I; and Not for students who have passed in STAT3902 Statistical models, or already enrolled in this course.	Y	Y	1, 2	Dec, May		Dr E K F Lam, Statistics & Actuarial Science	Major in Decision Analytics (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012)	Minor in Actuarial Studies (2015,2014,2013,2012); Minor in Risk Management (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT2603	Data management with SAS	6	Pass in STAT1600 Statistics: ideas and concepts, or already enrolled in this course	Y	Y	1, 2	Dec, May	50	Dr C W Kwan, Statistics & Actuarial Science	Major in Risk Management (2013,2012); Major in Statistics (2013,2012)	Minor in Risk Management (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
TAT2605	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 in or already enrolled in any of these courses: BIOL2102 Biostatistics, ECON1280 Analysis of economic data, STAT1601 Elementary statistical methods,	Y	Y	2	May		Ms L M S Kwan, Statistics & Actuarial Science		Minor in Actuarial Studies (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
			STAT1602 Business statistics, STAT2601 Probability and statistics I, STAT1603 Introductory statistics, STAT2901 Probability and statistics: foundations of actuarial science										
3TAT2901	Probability and statistics: foundations of actuarial science	6	(Pass in MATH1821 Mathematical methods for actuarial science I (for BSc(ActuarSc) students) or already enrolled in this course) or (Pass in MATH1013 University mathematics II or already enrolled in this course (for students outside the BSc(ActuarSc) programme); and	Y	Y	2	May		Prof J J F Yao, Statistics & Actuarial Science	BSc in Actuarial Science (2015,2014,2013,2012)	Minor in Actuarial Studies (2015,2014,2013,2012)		
			Not for students who have passed or enrolled in any of these courses: STAT1601 Elementary statistical methods, STAT1602 Business statistics, STAT2601 Probability and statistics I, STAT1603 Introductory statistics										
3TAT2902	Financial mathematics	6	Pass in STAT2901 Probability and statistics: foundations of actuarial science or already enrolled in this course; and Not for students who have passed in STAT3615 Practical mathematics for investment, or already enrolled in this course.	Y	Y	2	May		Prof K C Yuen, Statistics & Actuarial Science	BSc in Actuarial Science (2015,2014,2013,2012)			
STAT3600	Linear statistical analysis	6	Pass in STAT2602 Probability and statistics II; and Not for students who have passed in STAT3907 Linear models and forecasting, or have already enrolled in this course.	Y	Y	1, 2	Dec, May		Prof S M S Lee, Statistics & Actuarial Science	Major in Decision Analytics (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012)	Minor in Statistics (2015,2014,2013,2012)		
3TAT3602	Statistical inference	6	Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models	Y	Y	1	Dec		Prof S M S Lee, Statistics & Actuarial Science		BSc in Actuarial Science (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT3603	Probability modelling	6	Pass in STAT2601 Probability and statistics I; and Not for students who have passed in MATH3603 Probability theory, or have already enrolled in this course; and Not for students who have passed in STAT3903 Stochastic models, or have already enrolled in this course.	Y	Y	1	Dec		Dr J Song, Statistics & Actuarial Science	Major in Statistics (2015,2014,2013,2012)	Major in Risk Management (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		

Course Code	Title	Credi	Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / M (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	t of Statistics & Actuarial Sci		,						1=				
STAT3604	Design and analysis of experiments	6	Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models or STAT3611 Computer-aided data analysis	Y	Y	2	May		Dr G Li, Statistics & Actuarial Science		Major in Statistics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT3605	Quality control and management	6	Pass in BIOL2102 Biostatistics or (ECON1280 Analysis of economic data and any University level 2 course) or (STAT1601 Elementary statistical methods and any University level 2 course) or (STAT1602 Business statistics and any University level 2 course) or STAT2602 Probability and statistics II or (STAT1603 Introductory statistics and any University level 2 course) or STAT3902 Statistical models	Y	Y	2	May		Dr E A L Li, Statistics & Actuarial Science		Major in Statistics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT3606	Business logistics	6	Pass in BIOL2102 Biostatistics or (ECON1280 Analysis of economic data and any University level 2 course) or (STAT1601 Elementary statistical methods and any University level 2 course) or (STAT1602 Business statistics and any University level 2 course) or STAT2601 Probability and statistics I or (STAT1603 Introductory statistics and any University level 2 course) or STAT2901 Probability and statistics: foundations of actuarial science; and Not for students who have passed MATH3901 Operations research I, or have already enrolled in this course.	Y	Y	1	Dec		Ms O T K Choi, Statistics & Actuarial Science		Major in Statistics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT3607	Statistics in clinical medicine and bio-medical research	6	Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models	Y	Y	2	May		Prof G Yin, Statistics & Actuarial Science		Major in Statistics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT3608	Statistical genetics	6	Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models	Y	Y	2	May		Prof T W K Fung, Statistics & Actuarial Science		Major in Statistics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT3609	The statistics of investment risk	6	Pass in STAT2602 Probability and statistics II or (STAT1603 Introductory statistics and any University level 2 course) or STAT3611 Computer-aided data analysis or STAT3614 Business forecasting; and Not for students who have passed in FINA2320 Investments and portfolio analysis, 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 (2015,2014,2013,2012)	Minor in Risk Management (2015,2014,2013,2012)		
STAT3610	Risk management and insurance	6	Pass in BIOL2102 Biostatistics or (ECON1280 Analysis of economic data and any University level 2 course) or (STAT1601 Elementary statistical methods and any University level 2 course) or (STAT1602 Business statistics and any University level 2 course) or STAT2601 Probability and statistics I or (STAT1603 Introductory statistics and any University level 2 course) or STAT2901 Probability and statistics: foundations of actuarial science. (Not available to Actuarial Science students)	Y	Y	2	May		Dr R W L Wong, Statistics & Actuarial Science		Major in Risk Management (2015,2014,2013,2012); Minor in Risk Management (2015,2014,2013,2012)		

Course Code	Title	Credi	Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / M (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
epartmer	nt of Statistics & Actuarial	Science (Cont'd)										
STAT3611	Computer-aided data analysis	6	Pass in BIOL2102 Biostatistics or (ECON1280 Analysis of economic data and any University level 2 course) or (STAT1601 Elementary statistical methods and any University level 2 course) or (STAT1602 Business statistics and any University level 2 course) or (STAT1603 Introductory statistics and any University level 2 course); and Not for students who have passed in or have already enrolled in any of these courses; STAT2601 Probability and	N	N				Dr E K F Lam, Statistics & Actuarial Science		Major in Environmental Science (2015,2014,2013,2012); Minor in Risk Management (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
			statistics I, STAT2901 Probability and statistics: foundations of actuarial science, STAT3616 Advanced SAS programming										
STAT3612	Data mining	6	Pass in STAT2602 Probability and statistics II or (STAT1603 Introductory statistics and any University level 2 course) or STAT3902 Statistical models Co-requisites: STAT3600 Linear statistical analysis	Y	Y	2	No exam	50	Dr G C S Lui, Statistics & Actuarial Science	Major in Decision Analytics (2015,2014,2013,2012)	BSc in Actuarial Science (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012); Minor in Risk Management (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT3613	Marketing engineering	6	Pass in BIOL2102 Biostatistics or (ECON1280 Analysis of economic data and any University level 2 course) or (STAT1601 Elementary statistical methods and any University level 2 course) or (STAT1602 Business statistics and any University level 2 course) or STAT2601 Probability and statistics I or (STAT1603 Introductory statistics and any University level 2 course) or STAT2901 Probability and statistics and any University level 2 course) or STAT2901 Probability and statistics: foundations of actuarial science	Y	Y	1	Dec	50	Dr C W Kwan, Statistics & Actuarial Science		Major in Statistics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT3614	Business forecasting	6	Pass in BIOL2102 Biostatistics or (ECON1280 Analysis of economic data and any University level 2 course) or (STAT1601 Elementary statistical methods and any University level 2 course) or (STAT1602 Business statistics and any University level 2 course) or (STAT1603 Introductory statistics and any University level 2 course); and Not for students who have passed or already enrolled in any of these courses: STAT2601 Probability and statistics I, STAT2901 Probability and statistics: foundations of actuarial science, STAT3907 Linear models and forecasting, STAT4601 Time-series analysis, ECON2280 Introductory econometrics.	N	N				Dr R W L Wong, Statistics & Actuarial Science		Minor in Risk Management (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		

Course Code	Title	Credit	Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / Mi (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
•	t of Statistics & Actuarial Scie												
STAT3615	Practical mathematics for investment	6	Pass in (STAT1601 Elementary statistical methods and any University level 2 course) or (STAT1602 Business statistics and any University level 2 course) or STAT2601 Probability and statistics I or (STAT1603 Introductory statistics and any University level 2 course) or STAT2901 Probability and statistics: foundations of actuarial science; and Not for students who have passed in STAT2902 Financial mathematics, or have already enrolled in this course.	Y	Y	2	May		Dr E C K Cheung, Statistics & Actuarial Science	Major in Risk Management (2015,2014,2013,2012)	Minor in Actuarial Studies (2015,2014,2013,2012); Minor in Risk Management (2015,2014,2013,2012)		
STAT3616	Advanced SAS programming		STAT2601 Probability and statistics I or STAT2901 Probability and statistics: foundations of actuarial science (Students are strongly recommended to take STAT2603 Data management with SAS prior to taking this course.)	Y	Y	2	May	50	Prof K W Ng, Statistics & Actuarial Science		BSc in Actuarial Science (2015,2014,2013,2012); Major in Decision Analytics (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT3617	Sample survey methods	6	Pass or already enrolled in: BIOL2102 Biostatistics, or (ECON1280 Analysis of economic data and any University level 2 course), or (STAT1601 Elementary statistical methods and any University level 2 course), or (STAT1602 Business statistics and any University level 2 course), or STAT2601 Probability and statistics I, or (STAT1603 Introductory statistics and any University level 2 course), or STAT2901 Probability and statistics: foundations of actuarial science.	Y	Y	2	May		Ms O T K Choi, Statistics & Actuarial Science		Major in Statistics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
	Derivatives and risk management		Pass in STAT3615 Practical mathematics for investment; and Not for BSc(Actuarial Science) students; and Not for students who have passed in STAT3910 Financial economics I, or have already enrolled in this course; and Not for students who have passed in STAT3905 Introduction to financial derivatives, or have already enrolled in this course; and Not for students who have passed in FINA2322 Derivatives, or have already enrolled in this course.	Y	Y	1	Dec		Dr R W L Wong, Statistics & Actuarial Science		Major in Risk Management (2015,2014,2013,2012); Minor in Risk Management (2015,2014,2013,2012)		
STAT3620	Modern nonparametric statistics	6	Pass in STAT2602 Probability and statistics II	Y	Y	1	Dec		Dr P L H Yu, Statistics & Actuarial Science		Major in Decision Analytics (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT3621	Statistical data analysis	6	STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting (Students are strongly recommended to take STAT2603 Data management with SAS prior to taking this course.)	Y	Y	2	May	50	Dr G Tian, Statistics & Actuarial Science		Major in Decision Analytics (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT3622	Data visualization	6	STAT2602 Probability and statistics II	N	Y				Dr P L H Yu, Statistics & Actuarial Science		Major in Decision Analytics (2015,2014,2013,2012)		

Course Code	Title	Credi	t Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quot	a Course Coordinator		Major / M (The Major/Minor that thi		
						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
-	t of Statistics & Actuarial Sci Directed studies in statistics		Pass in at least 24 credits of advanced level disciplinary core/elective courses (STAT3XXX, STAT4XXX or STAT6XXX) in the Major in Risk Management/Statistics/Decision Analytics; and Not for students who have already enrolled in STAT4799 Statistics project in this academic year. This capstone course is for Decision Analytics, Risk Management, and Statistics Majors only; 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	30	Prof S M S Lee, Statistics & Actuarial Science				Major in Decision Analytics (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012)
STAT3901	Life contingencies	6	(Pass in STAT2602 Probability and statistics II and STAT3615 Practical mathematics for investment) or (Pass in STAT2902 Financial mathematics and (Pass in STAT3902 Statistical models, or already enrolled in this course)) or (Pass in STAT2602 Probability and statistics II and STAT2902 Financial mathematics)	Y	Y	1	Dec		Prof K C Yuen, Statistics & Actuarial Science	BSc in Actuarial Science (2015,2014,2013,2012)	Minor in Actuarial Studies (2015,2014,2013,2012)		
STAT3902	Statistical models	6	Pass in STAT2901 Probability and statistics: foundations of actuarial science; and Not for students who have passed in STAT2602 Probability and Statistics II, or already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	1	Dec		Dr G Tian, Statistics & Actuarial Science	BSc in Actuarial Science (2015,2014,2013,2012)			
STAT3903	Stochastic models	6	For BSc(Actuarial Science) students only; and Pass in STAT2901 Probability and statistics: foundations of actuarial science; and Not for students who have passed in MATH3603 Probability theory, or have already enrolled in this course; and Not for students who have passed in STAT3603 Probability modelling, or have already enrolled in this course.	Y	Y	2	Мау		Dr Y K Chung, Statistics & Actuarial Science	BSc in Actuarial Science (2015,2014,2013,2012)			
STAT3904	Corporate finance for actuarial science	6	[(Pass in ACCT1101 Introduction to accounting and STAT2902 Financial mathematics) or (Pass in STAT3610 Risk management and insurance and STAT3615 Practical mathematics for investment)]; and Not for students who have passed in FINA1310 Corporate finance, or have already enrolled in this course.	Y	Y	2	May		Dr J K Woo, Statistics & Actuarial Science	BSc in Actuarial Science (2015,2014,2013,2012)	Minor in Actuarial Studies (2015,2014,2013,2012)		
STAT3905	Introduction to financial derivatives	6	Pass in STAT2902 Financial mathematics; and For BSc(Actuarial Science) students only; and Not for students who have passed in STAT4603 Derivatives and risk management, or have already enrolled in this course; and Not for students who have passed in FINA2322 Derivatives, or have already enrolled in this course.	Y	Y	1	Dec		Dr E C K Cheung, Statistics & Actuarial Science	BSc in Actuarial Science (2015,2014,2013,2012)			

Course Code	Title	Credi	t Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	a Course Coordinator		Major / Mi (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
-	t of Statistics & Actuarial Sci								T				
	Risk theory I		Pass in STAT3903 Stochastic models, or already enrolled in this course; or Pass in STAT3603 Probability modelling or MATH3603 Probability theory	Y	Y	2	May		Dr K C Cheung, Statistics & Actuarial Science	BSc in Actuarial Science (2015,2014,2013,2012)	Minor in Actuarial Studies (2015,2014,2013,2012)		
	Linear models and forecasting		(Pass in STAT2602 Probability and statistics II; or Pass in STAT3902 Statistical models, or already enrolled in this course); and For BSc(Actuarial Science) students only; and Not for students who have passed in STAT3600 Linear statistical analysis, or have already enrolled in this course; and Not for students who have passed in STAT4601 Time-series analysis, or have already enrolled in this course; and Not for students who have passed in STAT4601 Time-series analysis, or have already enrolled in this course; and Not for students who have passed in ECON2280 Introductory econometrics, or have already enrolled in this course.	Y	Y	2	May		Dr G C S Lui, Statistics & Actuarial Science	BSc in Actuarial Science (2015,2014,2013,2012)			
STAT3908	Credibility theory and loss distributions	6	Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models or STAT3906 Risk theory I	Y	Y	1	Dec		Dr K C Cheung, Statistics & Actuarial Science	BSc in Actuarial Science (2015,2014,2013,2012)	Minor in Actuarial Studies (2015,2014,2013,2012)		
STAT3909	Advanced life contingencies	6	Pass in STAT3901 Life contingencies, or already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	2	May		Prof H L Yang, Statistics & Actuarial Science	BSc in Actuarial Science (2015,2014,2013,2012)			
STAT3910	Financial economics I	6	Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models; and Not for students who have passed in STAT4603 Derivatives and risk management, or have already enrolled in this course; and Not for students who have passed in FINA2322 Derivatives, or have already enrolled in this course.	Y	Y	1	Dec		Prof H L Yang, Statistics & Actuarial Science	BSc in Actuarial Science (2015,2014,2013,2012)	Minor in Actuarial Studies (2015,2014,2013,2012)		
STAT3911	Financial economics II	6	Pass in MATH3603 Probability theory or STAT3603 Probability modelling or STAT3903 Stochastic models or STAT3910 Financial economics I	Y	Y	2	May		Prof H L Yang, Statistics & Actuarial Science	BSc in Actuarial Science (2015,2014,2013,2012)	Major in Risk Management (2015,2014,2013,2012); Minor in Actuarial Studies (2015,2014,2013,2012)		
3TAT3951	Advanced contingencies	6	Pass in STAT3909 Advanced life contingencies; and Pass in STAT3910 Financial economics I or already enrolled in this course; and For BSc(Actuarial Science) students only.	Y	Y	1	Dec		Dr E C K Cheung, Statistics & Actuarial Science		BSc in Actuarial Science (2015,2014,2013,2012)		
3TAT3952	Investment and asset management	6	Pass in STAT3901 Life contingencies; and For BSc(Actuarial Science) students only; and Not for students who have passed in FINA2320 Investments and portfolio analysis, or have already enrolled in this course.	N	N				TBC, Statistics & Actuarial Science		BSc in Actuarial Science (2015,2014,2013,2012)		
STAT3953	Fundamentals of actuarial practice	6	Pass in STAT3909 Advanced life contingencies; and For BSc(Actuarial Science) students only.	Y	Y	1	No exam		Dr L F K Ng, Statistics & Actuarial Science		BSc in Actuarial Science (2015,2014,2013,2012)		
STAT3954	Current topics in actuarial science	6	(Pass in STAT3901 Life contingencies, or already enrolled in this course; or Pass in STAT3909 Advanced life contingencies, or already enrolled in this course); and For BSc(Actuarial Science) students only.	N	N				Prof W K Li, Statistics & Actuarial Science		BSc in Actuarial Science (2015,2014,2013,2012)		

Course Code	Title	Credi	t Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / Mii (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	t of Statistics & Actuarial Sci	_	,										
STAT3955	Survival analysis		Pass in STAT3902 Statistical models, or already enrolled in this course; or Pass in STAT3600 Linear statistical analysis or STAT3901 Life contingencies	Y	Y	2	May		Dr J F Xu, Statistics & Actuarial Science		BSc in Actuarial Science (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
	Pension funds and pension mathematics	6	Pass in STAT3909 Advanced life contingencies	Y	Y	1	Dec		Prof G Ma, Statistics & Actuarial Science		BSc in Actuarial Science (2015,2014,2013,2012)		
STAT4601	Time-series analysis	6	Pass in STAT3600 Linear statistical analysis; and Not for students who have passed in STAT3614 Business forecasting, or have already enrolled in this course; and Not for students who have passed in STAT3907 Linear models and forecasting, or have already enrolled in this course.	Y	Y	1, 2	Dec, May		Dr G Li, Statistics & Actuarial Science	Major in Risk Management (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012)	Major in Decision Analytics (2015,2014,2013,2012); Minor in Risk Management (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT4602	Multivariate data analysis	6	Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting	Y	Y	2	May	50	Prof T W K Fung, Statistics & Actuarial Science	Major in Statistics (2015,2014,2013,2012)	BSc in Actuarial Science (2015,2014,2013,2012); Major in Decision Analytics (2015,2014,2013,2012); Minor in Statistics (2015,2014,2013,2012)		
STAT4603	Current topics in risk management	6	Pass in STAT4601 Time-series analysis	N	N				TBC, Statistics & Actuarial Science		Major in Risk Management (2015,2014,2013,2012); Minor in Risk Management (2015,2014,2013,2012)		
STAT4606	Risk management and Basel Accords in banking and finance	6	Pass in STAT3910 Financial economics I or STAT3905 Introduction to financial derivatives or STAT3618 Derivatives and risk management or (FINA2322 Derivatives and any University level 3 course).	Y	Y	2	May		Mr P K Y Pang, Statistics & Actuarial Science		Major in Risk Management (2015,2014,2013,2012); Minor in Risk Management (2015,2014,2013,2012)		
STAT4607	Credit risk analysis	6	Pass or already enrolled in STAT3910 Financial economics I or STAT3618 Derivatives and risk management or STAT3905 Introduction to financial derivatives or (FINA2322 Derivatives and any University level 3 course)	Y	Y	2	May		Dr K P Wat, Statistics & Actuarial Science		BSc in Actuarial Science (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Minor in Risk Management (2015,2014,2013,2012)		
STAT4608	Market risk analysis	6	(Pass in STAT3907 Linear models and forecasting and STAT3910 Financial economics I); or [Pass in STAT4601 Time-series analysis and (FINA2320 Investments and portfolio analysis or STAT3609 The statistics of investment risk)]	Y	Y	2	May		Dr Z Zhang, Statistics & Actuarial Science		BSc in Actuarial Science (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Minor in Risk Management (2015,2014,2013,2012)		
STAT4609	Big data analytics	6	Pass in STAT3612 Data mining	Y	Y	2	May		Dr G C S Lui, Statistics & Actuarial Science	Major in Decision Analytics (2015,2014,2013,2012)			
STAT4710	Capstone experience for statistics undergraduates	6	Students are expected to have satisfactorily completed at least 24 credits of advanced level (STAT3XXX, STAT4XXX or STAT6XXX) disciplinary core/elective courses in Decision Analytics, Risk Management, and Statistics Majors. Students who are interested in taking the course should submit their applications to the Department. This capstone course is for Decision Analytics, Risk Management, and Statistics Majors students only, and is mutually exclusive with STAT3799, STAT4799 and STAT4766.	Y	Y	1, 2	No exam	50	Prof W K Li, Statistics & Actuarial Science				Major in Decision Analytics (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012)

Course Code	Title	Credit	Pre-requisite	Avail	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	a Course Coordinator		Major / (The Major/Minor that th		
				2015- 2016	2016- 2017	0=year long 1=1st sem 2=2nd sem S=Summer	2013-2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	nt of Statistics & Actuarial Sci												
STAT4711	Capstone experience for actuarial science undergraduates	6	Pass in at least 24 credits of advanced level disciplinary core/elective courses (STAT3XXX, STAT4XXX or STAT6XXX) in BSc(Actuarial Science) programme including (STAT3901 Life contingencies, or already enrolled in this course; or Pass in STAT3909 Advanced life contingencies, or already enrolled in this course): and This capstone course is for BSc(Actuarial Science) students only, and is mutually exclusive with STAT4798 and STAT4767. The earliest that a student is allowed to take	Y	Y	1, 2	No exam	50	Prof W K Li, Statistics & Actuarial Science				BSc in Actuarial Science (2015,2014,2013,2012)
			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 (STAT3XXX, STAT4XXX or STAT6XXX) in the Decision Analytics, Risk Management, and Statistics Majors. This capstone course is for Decision Analytics, Risk Management, and Statistics Majors students only; 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		Dr K P Wat, Statistics & Actuarial Science				Major in Decision Analytics (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012)
STAT4767	Actuarial science internship	6	Pass in at least 24 credits of advanced level disciplinary core/elective courses (STAT3XXX, STAT4XXX or STAT6XXX) in BSc(Actuarial Science) programme including STAT3901 Life contingencies; and This capstone course is for BSc(Actuarial Science) students only; and is mutually	Y	Y	1, 2	No exam		Dr L F K Ng, Statistics & Actuarial Science				BSc in Actuarial Science (2015,2014,2013,2012)
			exclusive with STAT4711. The earliest that a student is allowed to take this capstone course is their year 3 study.										
STAT4798	Statistics and actuarial science project	6	Pass in at least 24 credits of advanced level disciplinary core/elective courses (STAT3XXX, STAT4XXX or STAT6XXX) in BSc(Actuarial Science) programme including STAT3902 Statistical models and STAT3907 Linear models and forecasting; and Pass or already enrolled in at least one of the following courses: STAT3616 Advanced SAS programming, STAT3911 Financial economics II, STAT4601 Time-series analysis; STAT4602 Multivariate data analysis; and This capstone course is for BSc(Actuarial Science) students only; 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 (2015,2014,2013,2012)

Course Code	Title	Credi	Pre-requisite	Avail	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / Mi (The Major/Minor that this		
						0=year long 1=1st sem 2=2nd sem S=Summer			TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
•	t of Statistics & Actuarial Sc												
STAT4799	Statistics project	12	Pass in at least 24 credits of advanced level disciplinary corre/elective courses (STAT3XXX, STAT4XXX or STAT6XXX) in the Major in Risk Management / Statistics / Decision Analytics including STAT3600 Linear statistical analysis; and Pass or already enrolled in at least one of the following courses: STAT3616 Advanced SAS programming, STAT3911 Financial economics II, STAT4601 Time-series analysis; STAT4602 Multivariate data analysis; and Not for students who have already enrolled in STAT3799 Directed studies in statistics in this academic year. This capstone course is for Decision Analytics, Risk Management, and Statistics Majors students only; 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	30	Prof S M S Lee, Statistics & Actuarial Science				Major in Decision Analytics (2015,2014,2013,2012); Major in Risk Management (2015,2014,2013,2012); Major in Statistics (2015,2014,2013,2012)
STAT4901	Risk theory II	6	Pass in STAT3906 Risk theory I	Y	Y	2	May		Dr J K Woo, Statistics & Actuarial Science		BSc in Actuarial Science (2015,2014,2013,2012)		
STAT4902	Selected topics in actuarial science	6	Pass in STAT3906 Risk theory I	N	N				TBC, Statistics & Actuarial Science		BSc in Actuarial Science (2015,2014,2013,2012)		
STAT4903	Actuarial techniques for general insurance	6	Pass in STAT3906 Risk theory I	Y	Y	2	May		Dr L F K Ng, Statistics & Actuarial Science		BSc in Actuarial Science (2015,2014,2013,2012); Minor in Actuarial Studies (2015,2014,2013,2012)		
STAT7609	Research methods in statistics	6	Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting	Y	Y	1	Dec		Dr J F Xu, Statistics & Actuarial Science				
STAT7610	Advanced probability	6	Pass in STAT3603 Probability modelling or STAT3903 Stochastic models	Y	Y	1	Dec		Prof J J F Yao, Statistics & Actuarial Science				
STAT7611	Computational statistics	6	Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting	Y	Y	1	Dec		Dr G Tian, Statistics & Actuarial Science				
STAT7614	Advanced statistical modelling	6	Pass in STAT3600 Linear statistical analysis	Y	Y	2	May		Dr Y K Chung, Statistics & Actuarial Science				
STAT7615	Advanced quantitative risk management and finance	6	Pass in STAT4608 Market risk analysis	Y	Y	2	May		Prof W K Li, Statistics & Actuarial Science				

Course Code	Title	Credi	t Pre-requisite	Availa	able in	Semester offered in 2015-2016	Exam held in 2015-2016	Quota	Course Coordinator		Major / (The Major/Minor that th		
						0=year long 1=1st sem 2=2nd sem S=Summer	2010 2010		TBC = To be confirmed	Disciplinary Core Course	Disciplinary Elective	Capstone - Disciplinary Core Course	Capstone - Disciplinary Elective
	ore Courses												
	Science and Technology: Lessons from China		NIL	Y	Υ	1	Dec		Prof L S Chan, Earth Sciences				
	Feeding the World		NIL	Y	Y	1	No exam	132	Prof H Corke, Biological Sciences				
CCGL9017	Food: Technology, Trade and Culture	6	NIL	Y	Y	1	Dec		Prof H Corke, Biological Sciences				
CCGL9033	Weapons of Mass Destruction: Science, Proliferation and Terrorism	6	NIL	Y	Y	2	No exam	168	Dr K H Lemke, Earth Sciences				
CCGL9043	Obesity: Beyond a Health Issue	6	NIL	Y	Y	2	No exam	120	Dr E T S Li, Biological Sciences				
CCST9011	Biotechnology - Science and Impacts	6	NIL	Y	Y	1	No exam	120	Prof F C C Leung, Biological Sciences				
CCST9012	Our Place in the Universe	6	NIL	Y	Y	2	May	120	Prof S Kwok, Faculty				
CCST9013	Our Living Environment	6	NIL	Y	Υ	2	No exam	120	Dr S C Chang, Earth Sciences				
CCST9014	Science and Music	6	NIL	Y	Y	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	Y	2	No exam	120	Dr Z H Liu, Earth Sciences				
CCST9021	Hong Kong: Our Marine Heritage	6	NIL	Y	Υ	2	No exam	120	Prof K M Y Leung, Biological Sciences				
CCST9022	How the Mass Media Depicts Science, Technology and the Natural World	6	NIL	Y	Y	1	No exam	120	Prof H F Chau, Physics				
CCST9023	The Oceans: Science and Society	6	NIL	Y	Y	1	No exam	120	Dr J A King, Earth Sciences				
	Scientific Revolutions: Their Continuing Impact on Our World and Society	6	NIL	Y	Y	2	No exam	120	Prof Q A Parker, Physics				
CCST9028	Science and Technology: Facts and Fallacies	6	NIL	Y	Y	1	Dec	120	Prof A B Djurisic, Physics				
CCST9030	Forensic Science: Unmasking Evidence, Mysteries and Crimes	6	NIL	Y	Y	1, 2	No exam	144	Prof D L Phillips, Chemistry				
CCST9036	Material World: Past, Present, and Future	6	NIL	Y	Y	2	No exam	120	Prof W K Chan, Chemistry				
CCST9037	Mathematics: A Cultural Heritage	6	NIL	Y	Y	2	No exam	120	Dr B R Kane, Mathematics				
CCST9038	Science and Science Fiction	6	NIL	Y	Y	1	No exam	120	Prof A B Djurisic, Physics				
CCST9039	Statistics and Our Society	6	NIL	Y	Y	2	May	120	Dr K C Cheung, Statistics & Actuarial Science				
CCST9043	Time's Arrow	6	NIL	Y	Y	2	May	120	Dr Y L Li, Earth Sciences				
	The Science and Lore of Culinary Culture	6	NIL	Y	Υ	2	No exam	120	Dr A M Y Yuen, Chemistry				
CCST9046	The Science of Mind-body- health Relationship	6	NIL	Y	Y	1	Dec	120	Dr G W Porter, Faculty				
	Simplifying Complexity	6	NIL	Y	Y	1	No exam	120	Dr T Bonebrake, Biological Sciences				
CCST9051	What are We Made of - the Fundamental Nature of Matter	6	NIL	Y	Y	2	No exam	120	Prof S Xu, Physics				
	Coffee, Cigarettes, and Alcohol	6	NIL	Y	Y	2	No exam	120	Dr G W Porter, Faculty				

Course Descriptions of BSc and

Language Courses

SCIENCE

BIOC1600 Perspectives in logical Offering Department	Biomedica				Quo	nta	
<u> </u>		Dr J Tanner, Biomedical Sciences (jatanner@hku.hk)			Qui	Ла	
Course Co-ordinator				r шпки.пк)			
Teachers Involved	Dr L Y L C Dr J Tanne	heng, B er, Biom	Biomedical Sciences iomedical Sciences edical Sciences Biomedical Sciences				
Course Objectives	fundament - Promote tasks Inspire st - Help stud	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.					
Course Contents & Topics	A Biochem	ical Per	spective on the Basic Sc	iences			
	The eleme electron); Water (the anyway?).	ents and Structure e unive	iochemistry I bonding (from carbon t e and conformation (thin rsal biochemical solver	king in 3 di	mensions); Isomeris	m (from mirrors	to thalidomide
		building	themistry g blocks of life (proteins (considering molecular				
	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).						
	D. Inspiring Biochemistry The protein; The gene; Vitamins and disease; Synthetic biology; The challenges of modern-day genetics Drugs-successes and failures.						
Course Learning Outcomes	On succes	sful com	npletion of this course, st	udents shou	uld be able to:		
	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						
	CLO 2 apply knowledge of biomolecular structure to review major discoveries and contemporary issues in molecular biology						
	CLO 3 in	terpret s	scientific data and discus	s major issu	ues in biochemistry u	sing the scientif	ic literature
	CLO 4 demonstrate skills in working and collaborating together with colleagues in practicals and in presentation of scientific ideas						
	CLO 5 relate how biochemistry intersects with the three basic sciences of biology, chemistry and physics, and recognize the transition from school to university level study Level 3 or above in HKDSE Biology, Chemistry, or Combined Science with Biology or Chemistry						
Pre-requisites (and Co-requisites and Impermissible combinations)	Level 3 o componen			Chemistry,	or Combined Scier	nce with Biolog	gy or Chemisti
Offer in 2015 - 2016	Y 1st s	sem			Exa	mination	Dec
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A Exceptionally good performance demonstrating comprehensive understanding of the subject matter; critical insight into use of scientific data and the scientific literature; superior presentation and group collaboration skills.						
	В		performance demonstrating full e scientific literature; good prese			herent insight into u	use of scientific data
	С		ctory performance demonstratic data and the scientific literatu				insight into use o
	D						
	Fail		nderstanding of subject matte ic literature and unable to prese			cientific data; no u	nderstanding of the
Course Type	Lecture-ba	sed cou	ırse				
Course Teaching	Activities			Deta	Details No. of		
& Learning Activities	Lectures			or w	orkshops		36
					ctical classess		12
	Reading /	Self stu	ıdy				50
	Assessme		•	Tas	Tasks and preparation		
Assessment Methods and Weighting	Methods		Details		Weighting in fina	α Δεερεί	sment Methods

	Assignments	including practical writeups	20	CLO 1,2,3,4,5
	Examination		50	CLO 1,2,3
	Project reports	group communication project	30	CLO 2,3,4,5
Required/recommended reading and online materials	TBC			

BIOC2600 Basic biochemis	stry (6 credit	s)			Academic Year	2015
Offering Department	Biomedical S	Sciences		(Quota	300
Course Co-ordinator	Prof D K Y S	Shum, Biomedical Sciences (s	humdkhk@	hku.hk)		
Teachers Involved	Prof P Enge Dr Z Cheung	Shum, Biomedical Sciences I, Biomedical Sciences g, Biomedical Sciences ong, Biomedical Sciences				
Course Objectives	process. We and non-scie	This course is designed to present an overview of biochemistry of fundamental importance to the lif process. We aim to develop appreciation of the basics in biochemistry as a common ground for scienc 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	enzymes; ba	d functions of carbohydrates, asic bioenergetics; key metab tic information				
Course Learning Outcomes	On successf	ful completion of this course, s	tudents sho	ould be able to:		
	CLO 1	relate structures to functions	of biomole	cules		
	CLO 2	explain the functions of key r	netabolic pi	rocesses		
	CLO 3	explain the significance of sig	gnaling acro	oss cell membranes	3	
	CLO 4	explain the flow of genetic in	formation			
Pre-requisites (and Co-requisites and Impermissible combinations)	Foundation Not for stud	Pass in BIOC1600 Perspectives in biochemistry or BIOL1110 From molecules to cells or ENGG12 Foundation of biochemistry for medical engineering; and Not for students who have passed in BIOL2220 Principles of biochemistry or MEDE2301 Life science (Biochemistry), or have already enrolled in these courses.				
Offer in 2015 - 2016	Y 1st se	em		E	Examination	Dec
Offer in 2016 - 2017	Υ					
Course Grade	A+ to F					
Grade Descriptors	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.					
	C 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	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-base	ed course				
Course Teaching	Activities		De	Details No.		No. of Hour
& Learning Activities	Lectures					3
	Tutorials					1:
	Reading / S	Self study				10
Assessment Methods and Weighting	Methods	Details		Weighting in fi		essment Method to CLO Mappin
	Assignmen	ts			20 CL	O 1,2,3,4
	Examinatio	n			60 CL	O 1,2,3,4
	Test				20 CL	O 1,2,3,4
Required/recommended reading and online materials		Cox MM (2008) Lehninger Printiochemistry textbooks, e.g. Beew York.				

BIOC3601 Basic metabolism	(6 credits)	Academic Year	2015	

Offering Department	Biomedical Scient	nces	Que	ota	80		
Course Co-ordinator	Dr N S Wong, E	iomedical Sciences (nswong@hl	ku.hk)				
Teachers Involved		r N S Wong, Biomedical Sciences r L Y L Cheng, Biomedical Sciences					
Course Objectives	how some of the could be applied of metabolic en	s to provide foundation concepts e basic concepts in biochemistry d to explain one of the most imp tergy. The course will lay the fo ajor and will also serve as a usefu	 (specifically those learne ortant and cardinal issues oundation for the more ac 	d in BIOC1 of biologica dvanced co	600 and BIOC2600 al life: the acquisitio		
Course Contents & Topics	organisms. Ma synthesis and purines and py reactions involv	his course focuses on the central metabolic pathways involved in the provision of energy needed by liv rganisms. Major metabolic pathways covered in this course include those that are involved in ynthesis and breakdown of glucose, glycogen, triacylglycerol, and amino acids. The metabolism urines and pyrimidines will also be considered. Emphasis is on the understanding of the metabolic actions involved and how they are regulated in relation to environmental cues. Metabolic derangemes a basis of diseases will also be discussed.					
Course Learning Outcomes	On successful of	ompletion of this course, students	s should be able to:				
	CLO 1 explain	the significance of individual ste	os in a metabolic pathway				
	CLO 2 recogn	ize the importance and the need	for regulation of metabolic	pathways			
	CLO 3 discuss	s the roles of enzymes in the regu	lation of metabolic pathwa	vs			
	CLO 4 describ	e how metabolic process are in	ntegrated under different	physiologic	al and pathologica		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOC26 I (Biochemistry)	000 Basic biochemistry or BIOL22	220 Principles of biochemis	stry or MED	E2301 Life science		
Offer in 2015 - 2016	Y 1st sem		Exa	mination	Dec		
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	Demonstrates thorough and extensive knowledge and skills required for attaining all the course learning outcomes. Displays a strong analytical ability and logical thinking and is able to apply knowledge to a wide range of complex situations. Consistently able to communicate sophisticated ideas confidently and clearly. B Demonstrates substantial knowledge and skills required for attaining most of the course learning outcomes. Shows						
	evidence of analytical ability and logical thinking and is sometimes able to apply knowledge to complex situations. Often communicates complex ideas clearly. 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						
	D Den	miliar or uncomplicated situations. Someth nonstrates limited knowledge and skills re ytical ability and logical thinking and is	equired for attaining some of the o	course learning			
	Eail Demonstrates little or no evidence of knowledge and skills required for attaining the course learning outcomes. Lacks analytical ability and logical thinking and is unable to apply knowledge to solve problems. Ineffective at communicating ideas.						
Course Type	Lecture-based of	course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures		glycolysis; gluconeogenesis; pentose phosphate pathway; glycogen metabolis; lipid metabolis; purine and pyrimidine metabolism; regulation and integration of metabolic pathways		36		
	Tutorials		working on problems relating to the lecture topics		12		
	Reading / Self	study			100		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)		sessment Methods to CLO Mapping		
	Assignments		20	С	SLO 1,2,3,4		
	Examination		80	С	LO 1,2,3,4		
Required/recommended reading and online materials	Devlin TM (200 Jersey.	czko JL, Stryer L (2007) Biochem 6) Textbook of Biochemistry: wit MM (2008) Lehninger Principles	h Clinical Correlations, 6th	ed. Wiley-	Liss, Hoboken, Ne		

BIOC3602 Understandir	Academic Year	2015	
Offering Department	Biomedical Sciences	Quota	40
Course Co-ordinator	Dr L Y L Cheng, Biomedical Sciences (Icheng@hku.hk)		
Teachers Involved	Dr L Y L Cheng, Biomedical Sciences		

Course Objectives	students effects o	To strengthen students' understanding of metabolism. By using a problem-based learning (PBL) approach, students are trained in critical thinking and problem-solving skills. Students will be able to grasp the major effects on metabolic integration and control and they can use these concepts with greater confidence and success in approaching new problems and new areas of study.					
Course Contents & Topics	course w to illustra tutorial	vill be deli ate the ma format in	or pathways is applied to the vered in the form of lectures, ajor concepts of metabolic dis which students are giver bolic disturbances which lead	presenta seases. n cases	ations, etc. and supple The second half of the s to analyse and se	mented with e course will	audio-visual aids be delivered in a
Course Learning Outcomes	On succe	essful cor	mpletion of this course, studen	nts shou	ld be able to:		
	CLO 1	apply the	knowledge of major metaboli	c pathw	ays to the understandi	ng of disease	e mechanisms
		illustrate diseases	the major concepts of metals	polic dis	seases and discuss th	ne metabolic	disturbances in
	CLO 3	explain th	ne importance of metabolic int	egratior	and control		
	CLO 4	develop	critical thinking, problem-solvir	ng and p	presentation skills		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	BIOC360	1 Basic metabolism				
Offer in 2015 - 2016	N				Exam	nination	
Offer in 2016 - 2017	N						'
Course Grade	A+ to F						
Grade Descriptors	В	Shows wide ra	Demonstrates thorough and extensive knowledge and skills required for attaining all the course learning outcomes. Shows strong analytical ability and logical thinking in the critique of scientific data and is able to apply knowledge to a wide range of complex situations. Presents ideas clearly and coherently and collaborates proactively with peers. Demonstrates substantial knowledge and skills required for attaining most of the course learning outcomes. Shows evidence of analytical ability and logical thinking in the critique of scientific data and is often able to apply knowledge				
	С	Demor outcon someti	to a wide range of complex situations. Presents ideas coherently and collaborates effectively with peers. 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 in the critique of scientific data and is sometimes to apply knowledge to familiar situations. Has difficulty in presenting ideas coherently and collaborates passively with peers.				
	D	Demonstrates partial but limited knowledge and skills required for attaining some of the course learning outcom Shows poor analytical ability and logical thinking in the critique of scientific data and is rarely able to apply knowled to solve problems. Lacks clarity when presenting ideas and reluctantly collaborates with peers.					
	Fail	Demonstrates little or no evidence of knowledge and skills required for attaining the course learning outcomes. Lacks of analytical ability and logical thinking in the critique of scientific data and is unable to apply knowledge to solve problems. Incoherent presentation skills and unable to collaborate with others.					
Course Type	Lecture-l	based co	urse				
Course Teaching	Activitie	es		Deta	nils		No. of Hours
& Learning Activities	Lectures	s					36
	Tutorials	S					12
	Reading / Self study						100
Assessment Methods and Weighting	Method	ls	Details		Weighting in final course grade (%)		sment Methods o CLO Mapping
	Assignn	nents			50	CLO	1,2,3,4
	Examina	ation			50	CLC	1,2,3
Required/recommended reading	TBC						

BIOC3604 Essential techn	iques in biochemistry and molecular biology (6 credits)	Academic Year	2015				
Offering Department	Biomedical Sciences	Quota 70					
Course Co-ordinator	Dr K M Yao, Biomedical Sciences (kmyao @hku.hk)						
Teachers Involved	Prof D K Y Shum, Biomedical Sciences Dr B C W Wong, Biomedical Sciences Dr N S Wong, Biomedical Sciences Dr K M Yao, Biomedical Sciences Prof Z J Zhou, Biomedical Sciences						
Course Objectives	To give students a general overview of different experimental approaches and model systems, and to provide students with hands-on experience in basic biochemical and molecular techniques.						
Course Contents & Topics	Basic concepts in experimental science; writing of lab notebooks biochemical, molecular, genomic and others; methods for isolation a lipids and nucleic acids; subcellular fractionation; enzyme assays acid manipulation - PCR, site-directed mutagenesis, blotting a restriction mapping.	nd analysis of carbohy and spectrophotomet	ydrates, proteins, ry; basic nucleic				
Course Learning Outcomes							

	On successful completion of this course, students should be able to:						
	CLO 1	CLO 1 explain the basic principles of various biochemical and molecular techniques					
	CLO 2	describ	e different experimental approa	ches for achieving d	efined experin	nental aims	
	CLO 3	apply di	ifferent techniques to biochemic	al and molecular an	alyses		
	CLO 4 v	vrite an	nd maintain a scientific laborator	y notebook satisfact	orily		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIO	ss in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or MEDE2301 Life scien					
Offer in 2015 - 2016	Y 2nd	sem			Examination	on May	
Offer in 2016 - 2017	Υ					<u>'</u>	
Course Grade	A+ to F						
Grade Descriptors	A	Shows	nstrates thorough and extensive knowl s strong analytical ability and logical tory skills and techniques with confide sions.	thinking, with evidence	of original tho	ught. Competently conducts	
	В	Demonstrates substantial knowledge and skills required for attaining most of the course learning or evidence of critical thinking and analytical skills. Conducts laboratory skills and techniques with conappraise data to draw appropriate conclusions.					
	С	Demonstrates general but incomplete knowledge and skills required for attaining most of the cours outcomes. Shows some evidence of critical thinking and analytical skills. Conducts laboratory skills and tec a satisfactory level of competence and can sometimes correctly appraise data and draw appropriate conclu					
	D	D 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	Demonstrates little or no evidence of knowledge and skills required for attaining the course learning outcomes. Lack analytical ability and logical thinking. Displays ineffective lab skills and techniques and is unable to use data to dra appropriate conclusions.					
Course Type	Lecture wit	h labor	ratory component course				
Course Teaching	Activities	i		Details		No. of Hours	
& Learning Activities	Lectures					12	
	Laboratory	У				54	
	Tutorials					6	
	Reading /	Self st	udy			76	
Assessment Methods and Weighting	Methods		Details	Weighting ir course grad	Weighting in final Asses		
	Assignme	nts		3 ***	50	to CLO Mapping CLO 1,2,3,4	
	Examinati				50	CLO 1,2,3	
Required/recommended reading and online materials	Scopes Rh Springer-V Wilson K, V	(1994) erlag, Nalker	JA and O'Donnell M (2012) Mo 4) Protein Purification: Principle New York. KM (2005) Principles and Tech Cambridge.	es and Practice. Sp	oringer Advan	ced Texts in Chemistry	

BIOC3605 Sequence bioir	formatic	s (6 credits)	Academic Year	2015				
Offering Department	Biomed	iomedical Sciences Quota 5						
Course Co-ordinator	Dr B C	W Wong, Biomedical Sciences (bcwwong@hku.hk)						
Teachers Involved	Dr B C	Dr B C W Wong, Biomedical Sciences						
Course Objectives	underlyi retrieve	This course will examine existing bioinformatics tools for DNA and protein sequence analysis. The underlying principles of these analysis programs and services will be presented. Students will learn how to retrieve, analyze, and compare protein and DNA sequences using bioinformatics tools available on the World Wide Web.						
Course Contents & Topics	DNA ar Entrez a	This course will introduce and discuss the following topics: DNA and protein sequence database, protein family databases; information searching and retrieval Entrez and SRS; Simple sequence analysis; sequence alignment: pair-wise alignment, multiple sequence alignment, substitution matrices; sequence database searching: algorithm and parameters; sequence patterns and motifs, and profiles; phylogenetic analysis; gene prediction.						
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1	search and retrieve sequence information from biological	databases					
	CLO 2	CLO 2 describe the algorithms for pairwise and multiple alignments, BLAST search, and phyl trees construction						
	CLO 3	CLO 3 perform sequence analysis using EMBOSS package and other web-based analysis tools						
	CLO 4 interpret results from sequence alignments and BLAST database searches							

	CLO 5 use r	CLO 5 use results from various sequence analysis tools to annotate a biological sequence						
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or BBMS2003 Human genetics or BBMS2007 Essential molecular biology or MEDE2301 Life science I						
Offer in 2015 - 2016	Y 2nd ser	n		Examination	May			
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	at	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.						
	th	B Demonstrates substantial command of a broad range of knowledge and skills required for attaining at least most of the course learning outcomes; evidence of critical thinking; good ability to apply bioinformatics skills in a range of context.						
		C Demonstrates general but incomplete command of knowledge and skills required for attaining most of the course learning outcome; some critical thinking; adequate ability to apply bioinformatics skills in a range of context.						
	Demonstrates partial but limited command of knowledge and skills required for attaining some of the course learning outcomes; limited critical thinking; limited ability to apply bioinformatics skills in a range of context.							
	Fail Demonstrates little or no evidence of command of knowledge and skills required for attaining the course learning outcomes; lack of critical thinking; little or no ability to apply bioinformatics skills in a range of context.							
Course Type	Lecture-based	I course						
Course Teaching	Activities		Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials				12			
	Reading / Se	If study			100			
Assessment Methods and Weighting	Methods	Details	Weighting in course grade		ssessment Methods to CLO Mapping			
	Assignments			30 (CLO 1,2,3,4,5			
	Examination			70	CLO 2,4			
Required/recommended reading and online materials	Proteins, 3rd 6 Mount DW (20	D, Ouellette BFF (2005) Bioinfo ed. Wiley, Hoboken, N.J. 004) Bioinformatics: Sequence a pring Harbor, New York.			•			

BIOC3606 Molecular medic	ine (6 cre	edits)	Academic Year	2015			
Offering Department	Biomedic	cal Sciences	Quota	50			
Course Co-ordinator	Prof D Y	Jin, Biomedical Sciences (dyjin@hku.hk)	'				
Teachers Involved	Prof D Y Prof M H	E Cheah, Biomedical Sciences Jin, Biomedical Sciences Sham, Biomedical Sciences o, Biomedical Sciences					
Course Objectives	disorders	o provide up-to-date knowledge of the molecular and cellular basis of human diseases including skelet isorders, cancer and infection with HIV and influenza viruses, thereby preparing the students for a care be biomedical, biotechnological, pharmaceutical and genomic research.					
Course Contents & Topics	therapeu skeletal and path and antik	This course covers molecular basis of skeletal disorders, cancer and viral diseases, and molecular basis of select herapeutics. Specific topics may include mouse model of human diseases, molecular basis of select skeletal disorders, oncogenes and tumour suppressor genes, genome instability, HIV science, genetiand pathogenesis of influenza viruses, molecular approaches to vaccine development, therapeutic protein and antibodies, stem cells, gene therapy, and nucleic acid therapeutics. Basic knowledge of biochemism and molecular cell biology is assumed for students taking this course.					
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1 explain the molecular mechanisms underlying selected human skeletal disorders, cancer and viral diseases						
	CLO 2 illustrate the application of molecular biology in medicine with examples						
	CLO 3 integrate and translate knowledge in molecular biology to new approaches in disease prevention and intervention						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	BIOC2600 Basic biochemistry or BIOL2220 Principles	of biochemistry or MEDE23	01 Life science I			
Offer in 2015 - 2016	Y 2n	d sem	Examination	May			
Offer in 2016 - 2017	Υ		,				
Course Grade	A+ to F						
Grade Descriptors	A	Displays a comprehensive grasp of the key concepts under omissions or errors. Able to articulate clearly with examples					

		strategies in disease prevention and intervention. Evidence of strong analytical and critical thinking when dealin complex scientific data. Some evidence for additional information beyond what is given in the lectures.					
	В	B Displays a substantial and near-complete grasp of the key concepts underlying the molecular basis of diseases, but without depth in some areas and with some omissions and factual errors. An understanding of though is clear. Able to relate knowledge in molecular biology to new strategies in disease prevent intervention. Able to apply analytical and critical thinking skills when dealing with scientific data.					
	С	somet	ays a general understanding of the times able to relate knowledge in motimes able to apply analytical and criti	lecular	biology to new strategies in dis	sease prevention and intervention.	
	D	able to	ays a limited understanding of the key o relate knowledge in molecular biolo analytical and critical thinking skills wh	gy to r	new strategies in disease prever		
	Fail	diseas	Displays an incorrect or incomplete understanding of the key concepts underlying the molecular basis of human disease and is unable to relate this knowledge to effective treatment strategies. No evidence of analytical or critical thinking skills when dealing with scientific data.				
Course Type	Lecture-ba	ased co	purse				
Course Teaching	Activities			De	etails	No. of Hours	
& Learning Activities	Lectures				36		
	Tutorials					12	
	Reading /	/ Self st	tudy			100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examinat	ion			80	CLO 1,2,3	
	Test				20	CLO 1,2,3	
Required/recommended reading and online materials			ecular Cell Biology 7th ed., 201 ecular Biology of the Cell 6th e				
	Cassimeris et al: Lewin's Cells, 2nd ed., 201						

	in bloche	emistry (6 credits)	Academic Year	2015					
Offering Department	Biomedic	al Sciences	Quota	36					
Course Co-ordinator	Prof J D I	Prof J D Huang, Biomedical Sciences (jdhuang@hku.hk)							
Teachers Involved		Huang, Biomedical Sciences mic staff in Biochemistry Major, Biomedical Sciences							
Course Objectives		Fo enhance students knowledge of a particular topic and the students self-directed learning hinking skills.							
Course Contents & Topics	member.	ent undertakes a self-managed study on a topic in bic The topic is preferably one not sufficiently covered in critical review or a synthesis of published work on th volved that would enhance the student's understanding	the regular curriculum. T e subject. A laboratory o	The directed stud					
Course Learning Outcomes	On succe	ssful completion of this course, students should be able	e to:						
	CLO 1	CLO 1 critically appraise research literature in a specific area of biochemistry and molecular biology							
	CLO 2	CLO 2 examine the theoretical or experimental basis for existing concepts							
	CLO 3	entify questions and evaluate issues for further research development							
Pre-requisites (and Co-requisites and		t least 24 credits of advanced level (level 3 or 4) discipl uding BIOC2600 Basic biochemistry and BIOL3401 Mc		oo iir Bioonomio					
Impermissible combinations)		tone course is for Biochemistry Major students only. est that a student is allowed to take this capstone cours	0,						
·	The earlie	tone course is for Biochemistry Major students only.	0,	No Exam					
Offer in 2015 - 2016	The earlie	tone course is for Biochemistry Major students only. set that a student is allowed to take this capstone cours	e is their year 3 study.	No Exam					
Offer in 2015 - 2016 Offer in 2016 - 2017	The earlie	tone course is for Biochemistry Major students only. set that a student is allowed to take this capstone cours	e is their year 3 study.	No Exam					
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	The earlie Y 1st	tone course is for Biochemistry Major students only. set that a student is allowed to take this capstone cours	e is their year 3 study. Examination Cal literature, displaying a comideas within a personal frameweyly with a supervisor to enhander audience in an effective	prehensive and decork of knowledge ar ce understanding are way and respon.					
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	The earlie Y 1st Y A+ to F	tone course is for Biochemistry Major students only. est that a student is allowed to take this capstone cours sem 2nd sem Summer Produces a sophisticated and detailed appraisal of the biochemi understanding of the selected topic. Able to contextualize all the evaluate relevant issues emerging from the study. Works proactiv scientific writing skills. Communicates the findings to a broad	e is their year 3 study. Examination Ical literature, displaying a comideas within a personal framewowly with a supervisor to enhanader audience in an effective and able to reflect honestly on or loaying a sound understanding work of knowledge and identify sor to enhance understanding	prehensive and decork of knowledge are understanding are way and response's own learning. of the selected topisome relevant issue and scientific writin					
Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	The earlie Y 1st Y A+ to F	tone course is for Biochemistry Major students only. est that a student is allowed to take this capstone cours sem. 2nd sem. Summer Produces a sophisticated and detailed appraisal of the biochemic understanding of the selected topic. Able to contextualize all the evaluate relevant issues emerging from the study. Works proactive scientific writing skills. Communicates the findings to a brocknowledgeably to questions. Excellent time-management skills at Produces a coherent appraisal of the biochemical literature, disparation of the ideas within a personal framewemerging from the study. Works constructively with a supervise skills. Clearly communicates the findings to a broader audience as the findings to a broader audience.	e is their year 3 study. Examination Exami	prehensive and dee ork of knowledge arce understanding are way and responde's own learning. of the selected topi some relevant issue and scientific writing most questions. Ab anding of the selecte akes some attempt o-workers to improvoworkers to improvo					

			ntific writing skills. Displays weak e-management and self-reflection		inication skills when presenting th	e findings to	ndings to a broader audience.	
	Fail	Unable to from the sto commu	Fails to appraise the biochemical literature and thus unable to display any understanding Unable to contextualize the ideas within a personal framework of knowledge or identify any refrom the study. Works in isolation, thus failing to make progress in understanding and scienti to communicate effectively when presenting the findings to a broader audience. No time-man to self-reflect.					
Course Type	Project-ba	ased cours	е					
Course Teaching	Activities			Details			No. of Hours	
& Learning Activities	Reading	/ Self study	у	at	least 120 hours on the pro	ject	120	
Assessment Methods and Weighting	Methods		Details	Details			Assessment Methods to CLO Mapping	
	Dissertation		including mind map (10%)		60		CLO 1,2,3	
	Oral pres	sentation			25		CLO 1,2,3	
	Research report S		Supervisor comments		15	C	CLO 1,2,3	
			ject supervisors					

BIOC4610 Advanced bioch	emistry	(6 credits)	Academic Year	2015			
Offering Department	Biomed	cal Sciences	Quota	50			
Course Co-ordinator	Dr K M	Yao, Biomedical Sciences (kmyao@hku.hk)					
Teachers Involved	Dr C H l Prof D k	Chan, Biomedical Sciences Fu, Biomedical Sciences KY Shum, Biomedical Sciences Yao, Biomedical Sciences					
Course Objectives	multicel	urse aims at providing students an in-depth underst ular organisms. This course is particularly useful for s a career in biomedical sciences.					
Course Contents & Topics	Cell-sur mechan kinases that acti	and intracellular signal transduction mechanisms face receptors and signal transduction proteins; ism; signaling pathways that control gene express the Ras/MAP kinase pathway, phosphoinositide sigvate Smads	ion: receptors that activate	e protein tyrosine			
	The mid	skeleton as target of signal transduction rotubule cytoskeleton; kinesin and dynein motor; the cytoskeletion and cell behavior; roles of the cytoskele;		; the intermediate			
	C. Protein trafficking and sorting pathways Translocation of secretory proteins - insertion into the ER; major protein sorting pathways; protein modification, folding and quality control in the ER; molecular mechanism of vesicular traffic; protein sorting and processing						
	D. Cell-cell and cell-matrix adhesion Cell-cell and cell-extracellular matrix (ECM) junctions and their adhesion molecules; cadherins and integrins; collagens and proteoglycans; when cell meets the matrix; regulation of signaling molecules by ECM						
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1 describe the molecular and cellular signal transduction mechanisms that mediate cellular communication to achieve a plethora of cellular responses						
	CLO 2	illustrate the controls of the metabolic and cellular cytoskeleton as target of signal transduction, protei cell and cell-matrix adhesion					
	CLO 3	develop critical thinking and analytical skills					
Pre-requisites (and Co-requisites and Impermissible combinations)		BIOC3601 Metabolism or BIOL3401 Molecular bogy or BIOL3404 Protein structure and function	oiology or BIOL3402 Cell	biology and cell			
Offer in 2015 - 2016	Y 1	st sem	Examination	Dec			
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough and complete mastery at an advance attaining all the course learning outcomes. Show strong critic thought, and ability to apply knowledge to a wide range of cor	al thinking and analytical skills, wit	h evidence of original			
	В	Demonstrate substantial command of a broad range of knowl course learning outcomes. Show evidence of critical thinking familiar and some unfamiliar situations.					
	С						

	lear	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some critical thinking and analytical skills, and ability to apply knowledge to most familiar situations.					
	outo	nonstrate partial but limited command of comes. Show evidence of some critical wledge to solve problems.					
	outo	nonstrate little or no evidence of commo comes. Lack of critical thinking and ana olems.					
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		30	CLO 1,2,3			
	Examination		70	CLO 1,2,3			
Required/recommended reading and online materials		2013) Molecular Cell Biology, 7th 2007) Molecular Biology of the C					

BIOC4611 Advanced bioch	emistry II	(6 credits)	Academic Year	2015					
Offering Department	Biomedica	al Sciences	Quota	50					
Course Co-ordinator	Prof D Ch	Prof D Chan, Biomedical Sciences (chand@hku.hk)							
Teachers Involved	Dr M Kota Dr C M Qi Dr J Tann	an, Biomedical Sciences ka, Physiology an, Biomedical Sciences er, Biomedical Sciences ong, Biomedical Sciences							
Course Objectives	sequence	This course is aim at providing students with an up-to-date knowledge of protein biochemistry sequence to structure and disease; realizing the importance of kinetics in cellular function ar appreciation of the technological advances in the characterization of macromolecules.							
Course Contents & Topics	conformat biomolecu magnetic	cluding protein folding and misfolding in diseases; crional changes in protein function; catalytic mechanishar interactions; characterization of macromolecules resonance and other spectroscopy methods; protein protein function.	sms of enzymes and e s using X-ray crystallo	enzyme kinetics graphy, nuclea					
Course Learning Outcomes	On succes	ssful completion of this course, students should be able	to:						
	CLO 1 describe how protein structures inform functions								
	CLO 2 recognize the roles of enzyme kinetics in cellular functions								
	CLO 3 derive structural information of macromolecules from experimental data								
	CLO 4 apply their knowledge on protein engineering and therapeutics, and on experimental designs in basic and applied research								
Pre-requisites (and Co-requisites and Impermissible combinations)	chemistry	BIOC3601 Metabolism; and BIOL3404 Protein structu I; and OC4610 Advanced biochemistry, or already enrolled in		M2441 Organi					
Offer in 2015 - 2016	N		Examination						
Offer in 2016 - 2017	N								
Course Grade	A+ to F								
Grade Descriptors	A	Clear and insightful description of how protein structure informs function; clear evidence of ability to recognize mechanisms of enzyme function and interpretation of data; effectual demonstration of applying knowledge to the design of scientific methodologies and cohesive, systematic and creative organization of information for presentation and communication.							
	B Clear description of how protein structure informs function; evidence of ability to recognize mechanisms of enzym function and interpretation of data; capable demonstration of applying knowledge to the design of scientif methodologies; and cohesive and systematic organization of information for presentation and communication.								
	В	Clear description of how protein structure informs function; evider function and interpretation of data; capable demonstration of	applying knowledge to the	design of scientific					
	С	Clear description of how protein structure informs function; evider function and interpretation of data; capable demonstration of	applying knowledge to the chation for presentation and com- nee of ability to recognize mec- of applying knowledge to the	design of scientific munication. hanisms of enzyme					
		Clear description of how protein structure informs function; evider function and interpretation of data; capable demonstration of methodologies; and cohesive and systematic organization of inform Awareness of how protein structure informs function; some evide function and interpretation of data; some capable demonstration	applying knowledge to the mation for presentation and com- nce of ability to recognize mec of applying knowledge to the entation and communication. mited evidence of ability to reconstration of applying knowledge.	design of scientific munication. hanisms of enzyme design of scientific ognize mechanisms te to the design o					
	С	Clear description of how protein structure informs function; evider function and interpretation of data; capable demonstration of methodologies; and cohesive and systematic organization of inform Awareness of how protein structure informs function; some evide function and interpretation of data; some capable demonstration methodologies and systematic organization of information for present superficial awareness of how protein structure informs function; lie of enzyme function and interpretation of data; superficial demo	applying knowledge to the chartion for presentation and commone of ability to recognize mec of applying knowledge to the entation and communication. The common of ability to reconstration of applying knowledge on for presentation and communication of applying knowledge on for presentation and communication of applying knowledge to the	design of scientific munication. hanisms of enzyme design of scientific opgrize mechanisms the to the design of nication. hanisms of enzyme					

Course Teaching	Activities		Details	No. of Hours
& Learning Activities	Lectures			36
	Tutorials			12
	Reading / Self s	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		70	CLO 1,2,3,4
Required/recommended reading and online materials		Structure and Mechanism in Preeman, New York.	rotein Science: A Guide to En	zyme Catalysis and Protein

BIOC4612 Molecular biolog	gy or the						2015	
Offering Department	Biomedic	cal Scien	ces		Quo	ta	50	
Course Co-ordinator	Prof K S	E Cheah	, Biomedical Sciences (hr.	mbdkc@h	ku.hk)			
Teachers Involved	Dr R K N Dr K M Y	Prof K S E Cheah, Biomedical Sciences Dr R K Ng, Biomedical Sciences Dr K M Yao, Biomedical Sciences Prof Z J Zhou, Biomedical Sciences						
Course Objectives			p-to-date knowledge of mexpression, molecular emb		biology, especially wi	ith respect to	the regulation	
Course Contents & Topics	function.	Through	hensive course covering on this course an understappost transcription will be ga	nding of				
Course Learning Outcomes	On succe	essful co	mpletion of this course, stu	dents sho	ould be able to:			
	CLO 1	CLO 1 describe the mechanisms for regulation of transcription, RNA processing and translation eukaryotes						
	CLO 2		how cellular homeostasis on at multiple levels	can be	maintained by a cor	mbination of	controls of gene	
	CLO 3	illustrate	the hierachy of gene expr	ession reg	julation in stem cells a	ind developme	ental processes	
	CLO 4	interpret	experimental results in ge	ne regulat	ion studies			
Pre-requisites (and Co-requisites and Impermissible combinations)			01 Metabolism or BIOL: 0L3404 Protein structure a					
Offer in 2015 - 2016	Y 2r	id sem			Exar	mination	May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	releva	nstrates a deep and compreher nce to disease and effectively r te and interpret experimental data	elates the k	nowledge to developmenta			
	В	releva		of eukaryotic gene expression and its cesses. Correctly analyses and interprets				
	C Demonstrates a basic understanding of the regulation of eukaryotic gene expression and its relevance to c is sometimes able to relate the knowledge to developmental processes. Displays a limited capacity to a interpret experimental data from gene regulation studies.							
	D							
	Fail							
Course Type	Lecture-l	pased co	urse					
				De	Details		No. of Hours	
	Activiti	es						
	Activitie Lecture:						36	
		S					36	
	Lecture	S	udy				12	
& Learning Activities Assessment Methods	Lecture	s s g / Self st	udy Details		Weighting in final course grade (%)		12 100 ssment Methods	
Course Teaching & Learning Activities Assessment Methods and Weighting	Lecture: Tutorial: Reading	s s g / Self st	· · · · · · · · · · · · · · · · · · ·		Weighting in final			

Required/recommended reading and online materials

Watson JD et al. (2014) Molecular Biology of the Gene, 7th ed. Pearson/Benjamin Cummings, San Francisco.

BIOC4613 Advanced techn	iques in bio	ochei	mistry & molecular biology	(6 credits)	Acader	nic Year	2015	
Offering Department	Biomedical	Scien	ces		Quota		70	
Course Co-ordinator	Prof D Cha	n, Bioı	medical Sciences (chand@hku.h	k)				
Teachers Involved	Prof D Y Jir Prof J D Hu	n & Dr lang, E lon	J Tanner, Biomedical Sciences B C W Wong, Biomedical Sciences Biomedical Sciences nedical Sciences	ces				
Course Objectives	disciplines.	This is an advanced experimental-based course for students majoring in Biochemistry and relate disciplines. The aim is to provide the necessary training for students to pursuit postgraduate researce ducation and potential employment in a scientific laboratory/industry environment.						
Course Contents & Topics	bioinformat	Hands-on experiments using advanced techniques in biochemistry, molecular and cell biology, a bioinformatics. Students will also have the opportunity to familiarize themselves with modern instrumer used in life sciences.						
Course Learning Outcomes	On success	ful co	mpletion of this course, students	should be able to	D:			
			he basic principles of current ad ar biology	vanced techniqu	es common	ly used in b	iochemistry and	
	CLO 2 ap	ply an	d perform these techniques in ot	ner novel experin	nental settin	gs		
	CLO 3 cri	tically	evaluate experimental data					
	CLO 4 de	sign a	Iternative approaches to test or v	alidate hypothes	es			
	CLO 5 wr	ite a c	oncise experimental report using	correct terminolo	ogies and no	menclature	S	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIC	C360	4 Essential techniques in bioche	mistry and molec	ular biology			
Offer in 2015 - 2016	Y 1st s	em			Examir	nation	Dec	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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; c ability to identify problems and generate solutions relating to applications in a laboratory setting; evidence of ability evaluate experimental data; systematic planning and organization of experimental design and presentation experimental data.						evidence of ability to	
	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 experimental 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	n labo	ratory component course					
Course Teaching	Activities			Details			No. of Hours	
& Learning Activities	Lectures			-			12	
	Laboratory	,					54	
	Tutorials						6	
	Reading /	Self st	udy				76	
Assessment Methods and Weighting	Methods		Details	Weighting in fin			sment Methods CLO Mapping	
	Assignmer	nts			50		,2,3,4,5	
	Examination		One 3-hour written examination	1	50		1,2,3,4	
Required/recommended reading and online materials			JM (2005) Principles and Techn Cambridge.	iques of Biochen	nistry and M	olecular Bio	logy. Cambridge	

BIOC4966 Biochemistry in	ternship (6 credi	ts)		Academic Yea	r 2015			
Offering Department	Biomedica	l Science	es		Quota	20			
Course Co-ordinator	Prof J D H	rof J D Huang, Biomedical Sciences (jdhuang@hku.hk)							
Teachers Involved		rof J D Huang, Biomedical Sciences Il academic staff in Biochemistry Major, Biomedical Sciences							
Course Objectives	major of st knowledge	s course aims to offer students the opportunities to gain work experience in the industry related to the jor of study. The workplace learning experience would be of great benefit to the students to apply the owledge gained in the study to the real work environments. Students have to take on at least 160 hours ernship work either within the University or outside the University arranged by the School/Departments.							
Course Contents & Topics	or various 2. Outside student wil	tasks as the univ I be supe	rsity: The student will be supervinstructed by the Supervisor. versity: The student will work in the student will work in the student of the student (the student (the student (the student).	n an external agen	cy related to the y (the External Si	major of study. Th			
Course Learning Outcomes	On succes	sful com	pletion of this course, students s	should be able to:					
	CLO 1	recogniz	ze the strengths and limitations	of their area of traini	ng or expertise				
	CLO 2	examine	e the role of science in our socie	ty					
	CLO 3	,							
Pre-requisites (and Co-requisites and Impermissible combinations)	Major inclu This capsto	iding BIC one cour	credits of advanced level (level 0C3604 Essential techniques in se is for Biochemistry Major student is allowed to take this ca	biochemistry & moled dents only.	ecular biology.	ırses in Biochemistı			
Offer in 2015 - 2016	Y 1st s	sem 2n	d sem Summer		Examination	No Exam			
Offer in 2016 - 2017	Υ								
Course Grade	Pass/Fail								
Grade Descriptors	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 colleagu	ited or no ability to solve problems in the d by supervisor(s). Fails to establish es, or clients in the job. Fails to satisfy rritten and oral report, or evaluation by s	effective collaboration the requirements set ou	or communication v	vith supervisor(s), other			
Course Type	Internship								
Course Teaching	Activities	•		Details		No. of Hours			
& Learning Activities	Internship	work		it is expected that work at least 160 equivalent of 4 we	hours (or the	160			
Assessment Methods and Weighting	Methods		Details	Weighting in course grad		sessment Methods to CLO Mapping			
	Written re	port	written report, employ feedback and oral presentation		100	CLO 1,2,3			
Additional Course Information	internship Students w Enrolment	will be r tho are in of this	etion of this course can be ecorded on the student's trans- nterested to enrol in this course course is not conducted via the tot Department/School office after	cript. This course washould contact the December on the course see	vill be assessed of Department to obte election system a	on "Pass/Fail" basi ain the approval. and should be mad			

BIOC4999 Biochemistry pr	oject (12 credits)	Academic Year	2015		
Offering Department	Biomedical Sciences	Quota 25			
Course Co-ordinator	Dr N S Wong, Biomedical Sciences (nswong@hku.hk)				
Teachers Involved	Dr N S Wong, Biomedical Sciences All academic staff in Biochemistry Major, Biomedical Sciences				
Course Objectives	To enable students to acquire the basic skills in scientific research communication (both orally and in writing), teamwork and time mai useful for those students who intend to pursue a career in life science	nagement. The cours			
Course Contents & Topics	Project-related topics in biochemistry, cell and molecular biology. Experimental methods in protein and nucleic acid biochemistry; bioinformatical appraisal of current science literature Formulation of research questions Design of experiments. Data analysis and interpretation. Scientific writing	ormatics and cell biolo	ogy.		
Course Learning Outcomes	On successful completion of this course, students should be able to:				

	CLO 1 de	escribe red	cent research development i	n a defin	ed area of biochemisti	ry and mo	olecular biology
	CLO 2 fo	rmulate re	esearch questions and desig	n experir	nents to address these	e question	าร
	CLO 3 apply appropriate experimental techniques to solve research problems						
	CLO 4 m	nanage and	d interpret experimental resu	ılts			
	CLO 5 d	evelop scie	entific writing skills and logic	ally repo	rt their research finding	gs	
Pre-requisites (and Co-requisites and Impermissible combinations)	Major incluand BIOC biochemist Advanced taken concorning the capsto.	uding 4 of 3604 Essery and B biochemis currently with one course	redits of advanced level (level) the following 5 courses: Blential techniques in bioched IOC4613 Advanced technotry and BIOC4613 Advanced the this course. The is for Biochemistry Major student is allowed to take this	OL3401 mistry ar iques in ed technicularity	Molecular biology, Bl nd molecular biology; biochemistry & mo ques in biochemistry anly.	OC3601 and BIC lecular b & molecu	Basic metabolism 0C4610 Advance iology. BIOC461
Offer in 2015 - 2016	Y Yea	Y Year long Examination				ation	No Exam
Offer in 2016 - 2017	Υ						·
Course Grade	A+ to F						
Grade Descriptors	A	existing kn insight and supervisor	executes a sophisticated and image nowledge. Displays tenacity and cod comprehensively evaluated in the and other co-workers to enhance udience in an effective way and resp	mmitment, ne context practical	generating a meaningful boof the original research quand scientific writing skills.	oody of data uestion. Wo Communic	a that is analysed with rks proactively with a ates the findings to a
	В	B Plans and executes a detailed experimental investigation, framing the research question within existing knowledge. Works with commitment, generating a sufficient body of data that is analysed and evaluated in the context of the original research question with skill and understanding. Works constructively with a supervisor and other co-workers to enhance practical and scientific writing skills. Clearly communicates the findings to a broader audience and responds knowledgeably to most questions. Able to time-manage effectively.					
	Plans and executes an experimental investigation, attempting to contextualize the research question. Works with adequate commitment in order to generate sufficient data for a reasonable analysis and evaluation in the context of the original research question. Works with a supervisor and other co-workers to improve practical and scientific writing skills. Communicates the findings to a broader audience with reasonable clarity and responds to most questions. Acceptable time-management skills.						
	D	Plans and executes a rudimentary experimental investigation, showing a limited ability to contextualize the research question. Displays minimal commitment when collecting data and is only able to undertake a superficial analysis and evaluation. Works reluctantly with a supervisor and other co-workers to develop practical and scientific writing skills. Displays weak communication skills when presenting the findings to a broader audience. Poor time-management skills.					
	Fail	commitme to improve	executes a flawed or simplistic exp nt when collecting data and produce practical and scientific writing skills idience. No time-management skills	es an incol s. Displays	nerent analysis and evaluati	ion. Works i	n isolation, thus failing
Course Type	Project-bas	sed course	9				
Course Teaching	Activities			Details	•		No. of Hours
& Learning Activities	Reading /	Self study					240
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		ssment Methods to CLO Mapping
	Dissertation	on			60	CL	.O 1,2,3,4,5
	Oral prese	entation	including continuous asse (15%)	ssment	40		CLO 5
Required/recommended reading and online materials	None pres	cribed					

O'' : D	•	6 credit	~,		Academic Year	2015			
Offering Department	Biological S				Quota	169			
Course Co-ordinator	Prof B K C	Chow, Bio	ological Sciences (bkcc@hku.h	k)					
Teachers Involved	Dr C S C Lo	o, Biologic uen, Biolo	ological Sciences al Sciences ogical Sciences pical Sciences						
Course Objectives	later studie	s in app	provide basic conceptual under lied biology, genetics, bioche d developmental biology.						
Course Contents & Topics	cells and to is divided in Genes and are the rule but not iden Metabolism requirement Cells and cothemselves cycle control Genetic engagement.	inspire futo 4 parts inheritands of genetical to, the and Heats? Why cell division to form to system gineerings? Is ger	roach will be adopted to enaburther investigation through the and the following is a list of soce: How do children resemble the interitance? What determine parents? What happen if so alth: How are diets related the can't we live without plants? In: What are the common feat issues and organs? What is a goes wrong? How newly forme and modern biology: To what netically modified food safe fortant?	exploration of contemme of the questions to heir parents? What is ness gender and sexuome genes are non-fulo good health? Do ures in a cell? How cell cycle and how it did cells commit thems extent can genes be	porary biological is to be asked and discount the central dogma ality? Why is that clinctional or mutated all humans have to do cells communicate is regulated? What elves for differentiat modified? Is gene to	sues. The cours ussed: of biology? Wh nildren resembl? he same dieta te and assemb t happens if ce ion? herapy the futu			
Course Learning Outcomes	On success	ful compl	etion of this course, students s	hould be able to:					
		derstand a living or	the relationships between gen ganism	es in a genome and	the inherited phenot	types expressed			
		CLO 2 learn the underlying principle on how mutation of a gene can lead to the development of a genetic disease							
	CLO 3 understand the importance of dietary intake of biomolecules in relationship to good health								
	CLO 4 describe various stages in a cell division and that disturbance of this process may result in cancer development								
	CLO 5 describe concepts used in genetic engineering								
	CLO 6 know some applications of genetic engineering in gene therapy and production of genetically modified food								
		· a o a . o o	u						
(and Co-requisites and Impermissible	NIL		·						
(and Co-requisites and Impermissible combinations)		em 2nd			Examination	Dec May			
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016					Examination	Dec May			
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017	Y 1st se				Examination	Dec May			
(and Co-requisites and Impermissible	Y 1st se	Demonstra outcomes. apply know		lities and logical thinking, w familiar and unfamiliar situ	e required for attaining al ith evidence of original th ations. Apply highly effe	I the course learning tought, and ability to the course organizations			
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Y 1st so Y A+ to F	Demonstra outcomes. apply know skills. Writ concepts. Demonstra learning ou to familiar	sem Ite thorough mastery at an advanced le Show strong analytical and critical abi vledge to a wide range of complex,	lities and logical thinking, warmiliar and unfamiliar situed, thoughtful intellectual range of knowledge require and critical abilities and logy effective organizational s	e required for attaining al ith evidence of original thations. Apply highly effer engagement with broated ed for attaining at least gical thinking, and ability	I the course learning tought, and ability to active organizations of relevant most of the course to apply knowledge			
Offer in 2016 - 2017 Course Grade	Y 1st so Y A+ to F	Demonstra outcomes. apply knov skills. Writ concepts. Demonstra thoughtful Demonstra thoughtful	sem Ite thorough mastery at an advanced less Show strong analytical and critical abilited by a wide range of complex, ings consistently demonstrate informate substantial command of a broad attoomes. Show evidence of analytical and some unfamiliar situations. Apply	lities and logical thinking, warmiliar and unfamiliar situed, thoughtful intellectual range of knowledge requirand critical abilities and log of effective organizational sign of relevant concepts. d of knowledge required d critical abilities and logic ive organizational skills. V	e required for attaining al ith evidence of original thations. Apply highly effer engagement with broaded for attaining at least gical thinking, and ability kills. Writings mostly de for attaining most of all thinking, and ability to Vritings mostly indicate i	I the course learnin, nought, and ability to ective organizations of relevan most of the course to apply knowledge monstrate informed the course learnin apply knowledge to nformed, intellectual			
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(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Y 1st so Y A+ to F A B C D Fail Lecture-bas Activities Lectures	Demonstra outcomes. apply know skills. Writ concepts. Demonstra learning or to familiar thoughtful Demonstra outcomes. most famili engageme Demonstra Show evid to apply k intellectual Demonstra analytical problems. engageme	sem Interpretable the thorough mastery at an advanced let Show strong analytical and critical abilities, ings consistently demonstrate informate substantial command of a broad atcomes. Show evidence of analytical and some unfamillar situations. Applyintellectual engagement with broad rare the general but incomplete comman Show evidence of some analytical an iare situations. Apply moderately effect with the concepts or theories but not always the partial but limited command of kneence of some coherent and logical thin nowledge to solve problems. Apply I engagement with concepts or theories the little or no evidence of command of and critical abilities, logical and coher Organizational skills are minimally int with concepts or theories. Writings and concepts of theories.	lities and logical thinking, war amiliar and unfamiliar situed, thoughtful intellectual range of knowledge required and critical abilities and logicy effective organizational sign of relevant concepts. It is a considerable of the construction of	e required for attaining al ith evidence of original thations. Apply highly efferengagement with broaded for attaining at least gical thinking, and ability kills. Writings mostly defor attaining most of the all thinking, and ability to drittings mostly indicate increadth or understanding hing some of the course trical and critical abilities. Organizational skills. Writings mostly indicate increadth or understanding hing some of the course trical and critical abilities. Organizational skills. Writings mostly indicate increases and critical and critical abilities.	I the course learning tought, and ability to possible or granizational drange of relevant most of the course to apply knowledge monstrate informed the course learning apply knowledge to informed, intellectual learning outcomes. Show limited ability tings indicate some groutcomes. Lack of knowledge to solve			

	Examination	60	CLO 1,2,3,4,5,6
	Test	40	CLO 1,2,3,4,5,6
Course Website	http://moodle.hku.hk/		

BIOL1111 Introductory mid	robiology	y (6 credits	s)		Academ	ic Year	2015
Offering Department	Biologica	Biological Sciences					80
Course Co-ordinator	TBC, Bio	logical Scien	ces ()				
Teachers Involved	TBC, Bio	logical Scien	ces				
Course Objectives		To introduce students to the diversity and function of microorganisms; and relate this to their importance the natural environment, disease and public health, food production and spoilage and the biotechnologindustry.					
Course Contents & Topics	genetics; animals	Evolutionary diversity of bacteria, archaea, eukarya and viruses; Metabolic strategies, cell biology genetics; Microbial ecology, marine microbiology, terrestrial microbiology; Microbial interactions animals and plants; The human microbiome; Medical microbiology and immunology; Biotechno applications; Food spoilage and food fermentations.					interactions with
Course Learning Outcomes	On succe	essful comple	etion of this course, student	s should	be able to:		
	CLO 1	describe the	key features of the major n	nicrobial p	ohyla and place them in	an evolu	tionary context
			major physiological and ms and compare the simila				
		,	nicroorganisms involved and production and spoilage		0 1	sses, hun	nan disease and
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL						
Offer in 2015 - 2016	N				Examina	ition	
Offer in 2016 - 2017	N						
Course Grade	A+ to F						
Grade Descriptors	A	excellent. Arguments creative and (70-84%) A	Meets the standard of excellen Additional reading or research are highly persuasive and show d appealing. pproaches the standard of excel	is evident. v excellent	Ideas show an exception judgment and prioritization continues are addressed. Organ	al understand in the state of issues. Property of interest on of interest of interest of interest of interest on of interest of interest on other orders of interest orders order order orders order order orders order order orders order order orders order orders order order order order order orders order	anding of concepts. resentation is highly deas and clarity are
	С	very good. Ideas show a complete understanding of concepts. Arguments are persuasive and prioritize major issue Presentation is creative and appealing. (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.					
	D	(45-54%) Below acceptable standard. Most criteria are addressed. Organization of ideas and clarity are w show an incomplete understanding of concepts. Arguments are not persuasive. Presentation lacks creativit appealing.					
	Fail (<45%) Unacceptable. Inability to identify major criteria. Very weak organization of ideas and clarity. Ideas show a lack of understanding of concepts. No coherent argument. Presentation lacks creativity or is unappealing.						
Course Type	Lecture v	with laborator	y component course				
Course Teaching	Activitie	es		Details			No. of Hours
& Learning Activities	Lectures	3					24
	Laborate	ory					24
	Tutorials	S					6
	Reading	J / Self study					100
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)		sment Methods o CLO Mapping
	Examina	ation			70		LO 1,2,3
	Laborate	ory reports			30		CLO 3
Required/recommended reading and online materials	Brock Bi number 5	iology of Mic 576.B86].	croorganisms, Pearson Be	enjamin (Cummings, 12th Editio	n, 2009	[HKU library ca
Course Website	http://mo	odle.hku.hk/					

BIOL1201 Introduction to food and nutrition (6 credits)		Academic Year	2015	
Offering Department	Biological Sciences		Quota	110
Course Co-ordinator	Prof N P Shah, Biological Sciences (npshah@hku.hk)			
Teachers Involved				

	Dr J W F	Wan, Bi	gical Sciences ological Sciences ological Sciences				
Course Objectives	To enable student to appreciate the multidisciplinary nature of the study of Food and Nutrition. From the farmer's field to the dinner table, a basic understanding of food production, processing and storage will be covered. Food safety, food selection behaviour as well as balanced nutrition as part of life style instrumental to good health will be discussed.						
			ndent course which can be er studies in Food and Nutriti			ious discipline	es. It also prepares
Course Contents & Topics	Topics will include food composition and functional properties of major components; food additives; food hygiene, safety and regulation; determinants of food choice; examples of complex processed foods healthy eating-concepts and practice; essential nutrients; dietary supplements; fad diets.						
Course Learning Outcomes	On succe	ssful cor	mpletion of this course, stude	ents sho	ould be able to:		
	CLO 1	understa	and the key components of fo	ood and	d be able to discuss th	neir functional	properties
	CLO 2	understa	and the significance of food s	safety a	nd be able to identify	sources of co	ntamination
	CLO 3	understa	and the concept of a balance	d diet			
	CLO 4	critically	assess and identify quack o	r fad di	ets		
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL						
Offer in 2015 - 2016	Y 1st	sem			Exa	amination	Dec
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough grasp of the subject matter covered. Show exceptional ability to articulate concepts and integrate knowledge. Demonstrate highly effective organization / writing skills.						
	B Demonstrate substantial grasp of the subject matter covered. Show full capacity to use the appropriate concepts and assimilate the materials to solve problems. Demonstrate effective organization / writing skills.						
	C Demonstrate general but incomplete grasp of the subject matter covered. Show ability to apply concepts to solve simple problems. Demonstrate adequate organization / writing skills.						
	Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Misunderstanding of the materials is not uncommon. Ability to apply concepts and solve simple problems is limited. Demonstrate basic organization / writing skills.						
	Fail Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Fail to understand concepts and show minimal competence in problem solving. Demonstrate poor organization and writing skills.						
Course Type	Lecture-b	ased co	urse				
Course Teaching	Activitie	s		De	etails		No. of Hours
& Learning Activities	Lectures	.			Johano		36
	Tutorials	.		stu	udent-centered learnin	ng	12
	Reading	/ Self st	udy				100
Assessment Methods and Weighting	Methods	5	Details		Weighting in final course grade (%)		essment Methods to CLO Mapping
	Assignm	ents			30	CL	O 1,2,3,4
	Examina	ition			70	CL	O 1,2,3,4
Required/recommended reading and online materials	Fenema (Brown A.	O.R. Foo Underst	Porter N.N. Food Science. C dd Chemistry. Marcel Dekker anding Food : Principles and es S.R. Understanding Nutri	, 1996 I Prepa	ration. Wadsworth, Ce		
Course Website	http://mod	odle.hku.	hk/				

BIOL1309 Evolutionary di	versity (6 credits)	Academic Year	2015			
Offering Department	Biological Sciences Quota 1					
Course Co-ordinator	Prof R M K Saunders, Biological Sciences (saunders@hku.hk)					
Teachers involved	Prof R M K Saunders, Biological Sciences Prof Y Sadovy, Biological Sciences Dr M Yasuhara, Biological Sciences TCB, Biological Sciences					
Course Objectives	To provide students with an introduction to the diversity of plant a resulted in fundamental changes in our understanding of evolutionary trees will be used as the basis for a survey of different for understanding how structures, processes and behaviours have ch	tionary history (phylogonetic	ogeny). Curren			
Course Contents & Topics	Introduction to the methodology for reconstructing the sequence of algae (Rhodophyta, Phaeophyta and Chlorophyta); non-vascular plants (Lycophyta, Psilophyta, Spher	its (Hepatophyta, Antl	nocerophyta and			

	Platyheli and Ad	minthes, Ann ctinopterygii);	elida, Mollusca, Nema	atoda, Arthro homorpha);	yta and Anthophyta); poda and Echinoderma reptiles (Anapsida, heria and Eutheria).	ata); fish	(Chondrichthyes	
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 interpret phylogenies in order to understand the relatedness of taxonomic groups and the pattern of evolutionary changes in structures, processes and behaviours							
	CLO 2 describe the characteristics of different evolutionary lineages of plants and animals and recall the names of the main taxonomic groups							
	CLO 3	explain the behaviours	possible selective a	idvantages	of the highlighted str	uctures,	processes and	
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL	IIL						
Offer in 2015 - 2016	Y 2r	nd sem			Examina	tion	May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	Α	A Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining most or all of the course learning outcomes, with extensive use of named examples. Show evidence of significant critical abilities and logical thinking. Apply highly effective presentation skills.						
	B Demonstrate substantial command of knowledge required for attaining most of the course learning outcomes, with some use of named examples. Show evidence of critical abilities and logical thinking. Apply effective presentation skills.							
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes, with only limited use of named examples. Show evidence of some critical abilities and logical thinking. Apply moderately effective presentation skills.							
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes, with insufficient use of named examples. Show evidence of limited critical abilities and logical thinking. Apply limited presentation skills.							
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes, without use of named examples. Show little or no evidence of critical abilities and logical thinking. Presentational skills are minimally effective or ineffective.							
Course Type	Lecture	with laborator	y component course					
Course Teaching	Activiti	es		Detail	Details No. of Hours			
& Learning Activities	Lecture	S					24	
	Laborat	tory			3			
	Reading	g / Self study			10			
Assessment Methods and Weighting	Method	ls	Details		Weighting in final course grade (%)		sment Methods o CLO Mapping	
	Examin	ation			70	С	LO 1,2,3	
	Laborat	ory reports			30	С	LO 1,2,3	
Required/recommended								
reading and online materials	TBC	pport a rt. D.	Dames. Invertebrate 2	oology (Gaul	naers, 2003, 7th ea.)			

BIOL1501 Bioethics (6 cre	dits)			Academic Year	2015			
Offering Department	Biologic	Biological Sciences Quota						
Course Co-ordinator	Prof F C	C Leung, Biological Sciences (fcleung@hku.hk)						
Teachers Involved	Prof F C	Prof F C C Leung, Biological Sciences						
Course Objectives	The aim	is to explore the ethical implications of the latest	major advance	es in biology and me	edicine.			
Course Contents & Topics	major a limited dying, e	rse will discuss research ethic between studer vancements in biological and medical sciences. c: genetics, reproduction, disease diagnosis and invironment, and the use of animals in research. mework and public policy raised by these advan-	. Major areas t nd therapy, de . Ethical and m	to be discussed inc evelopment, transp noral principles and	lude but are not lantation, aging,			
Course Learning Outcomes	On succ	essful completion of this course, students should	be able to:					
	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	CLO 2 reflect upon and formulate in a professional manner their own opinions on these matters as we as to understand and enter into a respectful dialogue with those who possess another point oview						
	CLO 3 understand the basis of one's own position, as well as the basis of another person's opinion							
	CLO 4 deal with the quandaries that arise when facing modern medical technology and advancements							

Pre-requisites (and Co-requisites and	NIL						
Impermissible combinations)	1						
Offer in 2015 - 2016	N		Exam	nination			
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	thir cor to	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.					
	log	monstrate substantial grasp of the subject ma ical thinking with some evidence of competer d techniques and analysis of data and results monstrate effective individual as well as collab	nce in professional-level problem to draw generally appropriate of	n solving. Use o conclusions to r	communication skills real-world problems.		
	crit ski cor	monstrate general but incomplete grasp of the classification and logical thinking with limited colls and techniques and analysis of data and inclusions to real-world problems. Demonstrated presentational skills.	mpetence in professional-level p results to draw moderately app	roblem solving. propriate but so	Use communication ometimes erroneous		
	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.						
			emonstrate individual as well as	s collaborative-t	based organizational		
	Fail De col ski err		ttle relevant information, of the si petence in professional-level pri results ineffectively, leading ger	ubject matter co oblem solving. nerally to inapp	overed. Show lack of Use communication ropriate and usually		
Course Type	Fail De col ski err	d presentational skills of limited effectiveness. monstrate little or no grasp, with retention of linerent and logical thinking, and minimal com lis and techniques and analysis of data and oneous conclusions to real-world problems. D anizational and presentational skills.	ttle relevant information, of the si petence in professional-level pri results ineffectively, leading ger	ubject matter co oblem solving. nerally to inapp	overed. Show lack of Use communication ropriate and usually		
••	Fail De col ski err org	d presentational skills of limited effectiveness. monstrate little or no grasp, with retention of li nerent and logical thinking, and minimal com lis and techniques and analysis of data and oneous conclusions to real-world problems. D anizational and presentational skills. Course	ttle relevant information, of the si petence in professional-level pri results ineffectively, leading ger ermonstrate ineffectiveness indivi	ubject matter co oblem solving. nerally to inapp	overed. Show lack of Use communication ropriate and usually collaborative-based		
Course Type Course Teaching & Learning Activities	Fail De col ski err org	d presentational skills of limited effectiveness. monstrate little or no grasp, with retention of li nerent and logical thinking, and minimal com lis and techniques and analysis of data and oneous conclusions to real-world problems. D anizational and presentational skills. Course	ttle relevant information, of the si petence in professional-level pri results ineffectively, leading ger	ubject matter co oblem solving. nerally to inapp	overed. Show lack of Use communication ropriate and usually collaborative-based		
Course Teaching	Fail De col ski err org Lecture-based Activities Lectures	d presentational skills of limited effectiveness. monstrate little or no grasp, with retention of li nerent and logical thinking, and minimal com lis and techniques and analysis of data and oneous conclusions to real-world problems. D anizational and presentational skills. Course	ttle relevant information, of the si petence in professional-level pri results ineffectively, leading ger ermonstrate ineffectiveness indivi	ubject matter co oblem solving. nerally to inapp	overed. Show lack of Use communication ropriate and usually collaborative-based No. of Hours		
Course Teaching	Fail De col ski err org Lecture-based Activities Lectures Tutorials	d presentational skills of limited effectiveness. monstrate little or no grasp, with retention of li nerent and logical thinking, and minimal com lis and techniques and analysis of data and oneous conclusions to real-world problems. D anizational and presentational skills. Course	ttle relevant information, of the si petence in professional-level pri results ineffectively, leading ger ermonstrate ineffectiveness indivi	ubject matter co oblem solving. nerally to inapp	overed. Show lack of Use communication ropriate and usually collaborative-based No. of Hours 36		
Course Teaching	Fail De col ski err org Lecture-based Activities Lectures	d presentational skills of limited effectiveness. monstrate little or no grasp, with retention of li nerent and logical thinking, and minimal com lis and techniques and analysis of data and oneous conclusions to real-world problems. D anizational and presentational skills. Course	ttle relevant information, of the si petence in professional-level pri results ineffectively, leading ger ermonstrate ineffectiveness indivi	ubject matter co oblem solving. nerally to inapp	overed. Show lack of Use communication ropriate and usually collaborative-based No. of Hours		
Course Teaching	Fail De col ski err org Lecture-based Activities Lectures Tutorials	d presentational skills of limited effectiveness. monstrate little or no grasp, with retention of li nerent and logical thinking, and minimal com lis and techniques and analysis of data and oneous conclusions to real-world problems. D anizational and presentational skills. Course	ttle relevant information, of the si petence in professional-level pri results ineffectively, leading ger ermonstrate ineffectiveness indivi	ubject matter co oblem solving. nerally to inapp idual as well as	overed. Show lack of Use communication ropriate and usually collaborative-based No. of Hours 36		
Course Teaching & Learning Activities	Fail De col ski err org Lecture-based Activities Lectures Tutorials Assessment	d presentational skills of limited effectiveness. monstrate little or no grasp, with retention of li nerent and logical thinking, and minimal com lis and techniques and analysis of data and oneous conclusions to real-world problems. D anizational and presentational skills. COURSE Details	ttle relevant information, of the si petence in professional-level pri results ineffectively, leading ger emonstrate ineffectiveness indivi Petails Weighting in final course grade (%)	ubject matter cooblem solving. nerally to inappidual as well as Asses:	No. of Hours No. of Hours 100 100 100 100 100 100 100 1		
Course Teaching & Learning Activities	Fail De col ski err org Lecture-based Activities Lectures Tutorials Assessment Methods	d presentational skills of limited effectiveness. monstrate little or no grasp, with retention of linerent and logical thinking, and minimal com list and techniques and analysis of data and oneous conclusions to real-world problems. Dianizational and presentational skills. Course Details continuous assessment constitution and debate and construction and	ttle relevant information, of the si petence in professional-level pri results ineffectively, leading ger emonstrate ineffectiveness indivi Petails Weighting in final course grade (%)	Assess	No. of Hours No. of Hours 12 100 Sment Methods of CLO Mapping		
Course Teaching & Learning Activities	Fail Decotors serving and serving serv	d presentational skills of limited effectiveness. monstrate little or no grasp, with retention of linerent and logical thinking, and minimal com list and techniques and analysis of data and oneous conclusions to real-world problems. Dianizational and presentational skills. Course Details continuous assessment constitution and debate and construction and	ttle relevant information, of the si petence in professional-level professional-level professional development of the single control of the single control of the single course grade (%) of e 60	Assess	No. of Hours No. of Hours 100 100 100 100 100 100 100 1		

BIOL1502 The gene (6 cree	dits)	Academic Year	2015				
Offering Department	Biological Sciences	Quota	50				
Course Co-ordinator	Prof F C C Leung, Biological Sciences (fcleung@hku.hk)						
Teachers Involved	Prof F C C Leung, Biological Sciences						
Course Objectives	The objective is to expose students to the impacts of genes to th human genome and many agricultural crops and animals genomes, i quality of life as well as lots of technical and ethical issues/challeng with. The goal of this course is to open up students from all backgrocalled the gene and its impact on various scientific and social disciplin	t brings not only pror ges that general pub ounds to this basic ur	nises of a better lic need to deal				
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 of 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 Genes and Human Behavior	loning					
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1 demonstrate understanding and to explain the principle of cloning	inheritance, recomb	inant DNA and				

	CLO 2	gain deep	p understanding about the adva	ncement of biotechno	logy			
	CLO 3	determine	e and explain the benefits age	and shortcomings of	the application	on of biotechnology		
Pre-requisites (and Co-requisites and Impermissible combinations)		NIL Not for students with level 3 or above in HKDSE Biology or Combined Science with Biology component or equivalent.						
Offer in 2015 - 2016	N				Examination			
Offer in 2016 - 2017	Υ	Y						
Course Grade	A+ to F	A+ to F						
Grade Descriptors	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	logical and te	nstrate substantial grasp of the subject thinking with some evidence of compe chniques and analysis of data and res nstrate effective individual as well as co	etence in professional-level ults to draw generally app	l problem solving. ropriate conclusior	Use communication skills ns to real-world problems.		
	С	critical skills a conclu	nstrate general but incomplete grasp of abilities and logical thinking with limited and techniques and analysis of data a sions to real-world problems. Demonsti esentational skills.	competence in profession and results to draw moder	al-level problem so ately appropriate	olving. Use communication but sometimes erroneous		
	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 communication skills and techniques and analysis of data and results ineffectively, leading generally to inappropriate and usually erroneous conclusions to real-world problems. Demonstrate ineffectiveness individual as well as collaborative-based organizational and presentational skills.							
Course Type	Lecture-	based cou	urse					
Course Teaching	Activit	ies		Details		No. of Hours		
& Learning Activities	Lecture			Dotallo		36		
& Learning Activities								
	Tutoria	ls				12		
		ls g / Self stu	udy		urs on 15 riting, 30 e preparation)			
Assessment Methods and Weighting		g / Self stu	udy Details	essay/report w	riting, 30 e preparation)	12		
	Readin	g / Self stu	1	essay/report w presentation (include	riting, 30 e preparation)	93 ssessment Methods		
	Readin	g / Self stu	Details	essay/report w presentation (include	riting, 30 e preparation) final As (%)	93 ssessment Methods to CLO Mapping		
	Readin Method Assigni	g / Self stu	Details discussion forum	essay/report w presentation (include	riting, 30 e preparation) final As (%)	93 ssessment Methods to CLO Mapping CLO 1,2,3		
	Method Assigni Essay	g / Self stu	Details discussion forum essays & written reports	essay/report w presentation (include Weighting in f course grade	riting, 30 e preparation) final (%) 35	93 ssessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3		
	Method Assigni Essay Presen Test	g / Self studs ds ments tation	Details discussion forum essays & written reports poster & oral presentation	essay/report w presentation (include Weighting in f course grade	riting, 30 e preparation) final (%) 35 25 30	93 ssessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3 CLO 1,2,3		

BIOL2102 Biostatistics (6 d	credits)		Academic Year	2015				
Offering Department	Biological	Biological Sciences Quota 135						
Course Co-ordinator	Dr G Pan	Dr G Panagiotou, Biological Sciences (gipa@hku.hk)						
Teachers Involved	Dr G Pan	Dr G Panagiotou, Biological Sciences						
Course Objectives	students studies. T	The purpose of this course is to familiarise students with probability and statistics. The course will give to students the skills to read, interpret, and critically evaluate the statistics used in medical and bioinformatic studies. The course will also introduce the students to the fundamental principles and planning techniques to be able to analyze their own data, choose the correct statistical test and avoid common statistical pitfalls.						
Course Contents & Topics	Normal P	on to Statistics; Describing, Exploring and Comparing Data; robability Distribution; Relations between Distributions; Intended Regression; Statistical tests; Non-Parametric Inference	erval estimation; Hypo					
Course Learning Outcomes	On succe	ssful completion of this course, students should be able to:						
	CLO 1	formulate biological questions into statistical questions						
	CLO 2	design experiments effectively						
	CLO 3	make quantitative estimation of biologically meaningful par	ameters					

	CLO 4	use R	to carry out some of the statisti	ical c	omputations			
	CLO 5	under	stand the assumptions of comm	nonly	used statistical method	ods		
	CLO 6	CLO 6 use Virtual Laboratories for Next Generation Sequencing experiments						
	CLO 7	evalua	ate critically the medical literatur	re				
Pre-requisites (and Co-requisites and Impermissible combinations)			00 Perspectives in biochemist ution or ENVS1301 Environmen					
Offer in 2015 - 2016	Y 2nd	sem			Exa	amination	May	
Offer in 2016 - 2017	Υ						'	
Course Grade	A+ to F							
Grade Descriptors	A	strong compu	nstrate thorough grasp of the subject a analytical and critical abilities and log tational skills and techniques for basic v appropriate and insightful conclusions	gical t statis	ninking, with evidence of tical analyses. Be able to	original thought. critically use data	Apply highly effective a and statistical results	
	В	outcon and te	nstrate substantial grasp of the subjectives. Present evidence of analytical and chniques for basic statistical analyses. sions. Apply effective organizational an	d critica Be ab	al abilities and logical think le to correctly use data an	ing. Apply effect	ive computational skills	
	С	C 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	Demonstrate partial and limited grasp of the subject and skills required for attaining some of the course learn outcomes. Present evidence of some coherent and logical thinking, but with limited analytical and critical abiliti Apply limited or barely effective computational skills and techniques for basic statistical analyses. Demonstr limited ability to use data and statistical results to draw appropriate conclusions. Apply limited or barely effect organizational and presentational skills.						
	Fail	outcon minima misuse	nstrate evidence of little or no grasp of nes. Present evidence of little or lack ally effective or ineffective computatio e of data and statistical results and/or tive organizational and presentational's	of an nal sl unab	alytical and critical abilities kills and techniques for b	s, logical and co asic statistical a	pherent thinking. Apply analyses. Demonstrate	
Course Type	Lecture-ba	sed co	urse					
Course Teaching	Activities			De	tails		No. of Hours	
& Learning Activities	Lectures				.ano		36	
	Tutorials			including projects			24	
	Reading /	Self st	udy		aramag projesto		100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		essment Methods to CLO Mapping	
	Assignme	ents			50	CLO	1,2,3,4,5,6,7	
	Examinati	ion			50	CL	O 1,3,5,7	
Required/recommended reading and online materials	Zar, J. H.:	Biostati	istical Analysis (Prentice-Hall / E	Engle	wood Cliffs, N.J., 199	99, 4th edition	n)	
Course Website	http://mood	dle.hku.	hk/					
· · · · · ·								

BIOL2103 Biological scien	nces laboratory course (6 credits)	Academic Year	2015			
Offering Department	Biological Sciences	Quota 215				
Course Co-ordinator	Dr W Y Lui, Biological Sciences (wylui@hku.hk)					
Teachers Involved	Dr W Y Lui, Biological Sciences Prof B K C Chow, Biological Sciences Dr A Yan, Biological Sciences					
Course Objectives	The objective is to provide students a comprehensive training in basic biological studies. The course will cover a number of techniques microbiologists to conduct scientific research.					
Course Contents & Topics	This course will be divided into three modules and each module will have Module one: Nucleic acid analysis DNA & RNA isolation, spectrometry, gel electrophoresis, restriction enalysis. Module two: Protein analysis Centrifugation, chromatography and SDS-PAGE electrophoresis. Module three: Microbiology Microscopy, observation of microorganisms and staining of bacteria, is and serial dilution, enumeration of microbial cells by Petroff-Hauss Identification and classification of microbes from natural source and stail	enzyme analysis and solation of pure culturer counting chambe	DNA sequence			
Course Learning Outcomes	identification and diagonication of microbes from flatural source and sta	adaysis.				

	On succ	cessful complet	tion of this course, students	should b	pe able to:				
	CLO 1	demonstrate l	knowledge in proper use of	simple r	esearch equipment				
	CLO 2	CLO 2 demonstrate knowledge and understanding of how and why certain techniques are used research setting							
	CLO 3	CLO 3 master some basic laboratory techniques for carrying out experiments							
	CLO 4		ne different ways that microopsponse to dye etc. and how	•	•	ording to	their size	, shape,	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	Pass in BIOL1110 From molecules to cells							
Offer in 2015 - 2016	Y 1:	st sem 2nd s	em		Examina	ation	Dec	May	
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	learning outo	e thorough mastery at an advanc comes. Show strong analytical and offective lab skills and technique Apply highly effective organization	d critical a es. Critica	abilities and logical thinking, values of data and results to	with evidend	ce of origina	al thought.	
	В								
	С	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	Evidence of lab skills and	e partial but limited command of k some coherent and logical thinking d techniques. Limited ability to use anizational and presentational skills	g, but with data and	limited analytical and critica	abilities. A	pply partiall	y effective	
	Fail	Evidence of ineffective la	little or lack of analytical and criti	ical abilitie of data	nowledge required for attaining the course learning outcollities, logical and coherent thinking. Apply minimally effective a and results and/or unable to draw appropriate conclusifective or ineffective.				
Course Type	Laborate	ory and worksh	nop course						
Course Teaching	Activit	ies		Detai	ls		No. o	of Hours	
& Learning Activities	Labora	tory		11 laboratory sessions (4 hours each)		ours		44	
	Tutoria	ls		lectur	e/tutorials			18	
	Readin	g / Self study						100	
Assessment Methods and Weighting	Method	ds	Details		Weighting in final course grade (%)		ssment N to CLO N		
	Labora	tory reports	plus lab performance		60	CI	_O 1,2,3,4	4	
	Test		1 hour final examination		40	(CLO 1,2		
Course Website	http://mo	oodle.hku.hk/			'				
Additional Course Information	Quota 8 Lab A o Quota 1	0 - 1st Semest n Wed. with 40 35 - 2nd Seme	students and Lab. B on The			ı Fri. with	45 stude	nts	

BIOL2220 Principles of bio	chemist	ry (6 credits)	Academic Year	2015
Offering Department	Biologic	al Sciences	Quota	100
Course Co-ordinator	Dr C S (C Lo, Biological Sciences (clivelo@hku.hk)	<u>'</u>	
Teachers Involved	Dr C S (C Lo, Biological Sciences		
Course Objectives		urse is designed to provide undergraduate (non-biochemist s in biochemistry as well as hands-on experience in biochem		w of fundamenta
Course Contents & Topics	with en	duction to various biomolecules in terms of their structures, nphasis on amino acids, proteins, enzymes, carbohydrions between their biochemical properties and their roles in v	ates, lipids and nu	cleic acids. The
Course Learning Outcomes	On succ	cessful completion of this course, students should be able to:		
	CLO 1	describe the key structural features of carbohydrates, protein	ns, lipids and nucleoti	des
	CLO 2	understand the basic enzyme kinetic properties		
	CLO 3	explain how the common sugars, fatty acids and amino acid living cells	ds are metabolized an	d synthesized in

Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in BIOL1110 From molecules to cells; and Not for students who have passed in BIOC2600 Basic biochemistry or have already enrolled in this cou						
Offer in 2015 - 2016	Y 1st s	1st sem Examination						
Offer in 2016 - 2017	Y				·			
Course Grade	A+ to F							
Grade Descriptors	A	course lear thought, an	ning outcomes. Show	strong analytical and ledge to a wide rang	of extensive knowledge and single critical abilities and logical the of complex, familiar and under and techniques	inking, with	evidence of original	
	В	course lear	ning outcomes. Show	evidence of analytica	knowledge and skills required al and critical abilities and log s. General integration of the	cal thinking	, and ability to apply	
	С	learning ou	tcomes. Show evidence	e of some analytical	owledge and skills required f and critical abilities and logi gration of theories, principles,	cal thinking,	and ability to apply	
	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. Limited integration of theories, principles, evidence and techniques						
	Fail	outcomes.	Lack of analytical and	critical abilities, logic	owledge and skills required f all and coherent thinking. Sho ration of theories, principles, e	w very little	or no ability to apply	
Course Type	Lecture wit	th laborator	y component cours	se				
Course Teaching	Activities	.		Detail	s		No. of Hours	
& Learning Activities	Lectures						24	
	Laborator	у		3 labo	ratory sessions		24	
	Tutorials						12	
	Reading /	Self study					100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		sment Methods o CLO Mapping	
	Examinati	ion			60	С	LO 1,2,3	
	Laborator	y reports			10	С	LO 1,2,3	
	Test				30	С	LO 1,2,3	
Required/recommended reading and online materials	L.A. Morai Internation		rton, K.G. Scrimge	eour, M.D. Perry	r: Principles of Biochen	nistry 5th	edition (Pearson	
	http://mood							

BIOL2306 Ecology and evo	lution (6 credit	ts)	Academic Year	2015
Offering Department	Biological Scien	nces	Quota	80
Course Co-ordinator	Prof D Dudgeon	n, Biological Sciences (ddudgeon@hku.hk)	'	
Teachers Involved		n, Biological Sciences ns (Field course component only), Biological Scier	nces	
Course Objectives	order to explains with their living explain the sign provides the o	between organisms and their environment is add is how the ecology of plants and animals has beer and non-living environment. The course also de nificance of what we see in nature using scien opportunity to investigate how the environment adaptive radiation in a variety of habitats.	n shaped by evolution thro emonstrates how we can tific methods. A field co	ough interactions understand and urse componen
Course Contents & Topics	they live and he influences their responsible for some basic scie by physiological biodiversity. Ind population dyna and evolution re origins of mode ecological trans with an account Lectures are covisit a variety of	nt influences organisms profoundly. It affects their low many can survive there) and, through natural form and adaptations. Present day human-induct endangering species and degrading their habit entific principles of ecology and evolution, showin all tolerances and evolutionary adaptation which, in dividuals and their interactions will be a major focus amics, community structuring, life histories, and resulting from interaction with the environment will ern humans, including our fossil record and relastformations caused by humans and their environment will be importance of biodiversity, and the factors omplemented by a 5-day residential field course of Hong Kong habitats to study their biodiversity, cosms and their environment	al selection acting over posed changes to the envirtats. This introductory or go how they are linked to not turn, lead to specialization of turn, lead to specialization of the course together whiche dynamics. The principle also be demonstrated by tionship to other primate mental impacts. The court that threaten it globally, during the Reading Wee	past generations onment are also ourse introduces the environment on and generate with discussion ociples of ecology describing the s, and the mair se will conclude k when students
Course Learning Outcomes	On successful c	completion of this course, students should be able	to:	
		stand how scientific methods (hypotheses, ex	periments, comparisons) are used to

			nd the basic mechanism daptation and generate I			interactions	with the environment			
			nd that ecology and beh			e light of sele	ective pressures from			
		CLO 4 understand the ecological factors influencing evolution, using the human evolutionary tree as an example								
			nd the community ecolors of organisms found t		iodiversity of selected	Hong Kong	habitats, and typical			
Pre-requisites (and Co-requisites and Impermissible combinations)			09 Evolutionary diver science or ENVS1401 I				cells or ENVS1301			
Offer in 2015 - 2016	Y 1st	sem			1	Examination	Dec			
Offer in 2016 - 2017	Υ						l l			
Course Grade	A+ to F									
Grade Descriptors	A	attainn habitat	nce of complete or near-complete or all learning outcomes, s. Show excellent organization ading (for A+) work relative to	and excellenal, present	ent use of named (organis ational and/or analytical sk	m) examples, ir	cluding local species and			
	В	of lear	ce of substantial understandir ning outcomes, and use of r zational, presentational and/or ed at degree level.	amed (orga	anism) examples, including	local species	and habitats. Show good			
	C Evidence of general understanding wit general but incomplete attainment of mm Show fair organizational, analytical, pre for what is required for degree level.			most of the	learning outcomes, with li	mited use of nai	med (organism) examples.			
	knowledge is very incomplete), as dem			lemonstrate	of relevant information and incomplete understanding of the subject (i. monstrated by partial but limited attainment of learning outcomes. Insufficie abitats or organisms. Work merely (for D+) or barely (D) adequate for what					
	Fail Evidence of poor or inadequate knowledge and understanding of the subject such that the majority of learning outcomes cannot be attained. Little or no evidence of familiarity with fieldwork techniques, habitats or organisms. Work fails to reach degree level.									
Course Type	Lecture wi	ith labor	atory component course	!						
Course Teaching	Activities	S		1	Details		No. of Hours			
& Learning Activities	Lectures			(24 hours lectures, plu of lectures during resi course		34			
	Laboratory			at least 36 hol laboratory work, a individuals			36			
	Reading / Self study		udy	i r	during the semester in the form internet tutorials, assigne reading and a laborato workshop		ed 80			
Assessment Methods and Weighting	Methods		Details		Weighting in fir course grade (ssessment Methods to CLO Mapping			
	Assignme	ents				30	CLO 5			
	Examinat	ion				70	CLO 1,2,3,4			
Required/recommended reading and online materials	in HKU lib	rary.)	.B. (1997) How Humans		,	•				
	An up-to-	date list	Ecology: Theories and A of references to the p t to each lecture will be p	orimary s	cientific literature, ba	ckground re	,			
Course Website	http://www	.biosch	.hku.hk/ecology/lsc/							
Additional Course Information	Details of	the loca 1, will be	ay residential field compation and cost of the real made available at the	sidential f	ield course, which wi	Il be held in	the Reading week of 5-2016 was \$820 (no			

BIOL3105 Animal phys	iology and environmental adaptation (6 credits)	Academic Year	2015		
Offering Department	Biological Sciences	Quota 40			
Course Co-ordinator	Prof A O L Wong, Biological Sciences (olwong@hku.hk)				
Teachers Involved	Prof A O L Wong, Biological Sciences Prof A S T Wong, Biological Sciences Dr W Y Lui, Biological Sciences				
Course Objectives					

	The course covers the major aspects of animal physiology for environmental adaptation in terre aquatic habitats. Stress will be given to the functional interactions between animals and the environment especially on the mechanisms by which animals obtain resources for survival from the environment environmental changes via sensory structures, and respond to adversities in the environment by their body forms & functions.						the environment, nvironment, detect	
Course Contents & Topics	Basic concepts of animal adaptation to environmental changes/extreme environment; Modifienergy metabolism according to oxygen availability; Different models of gaseous exchange for inter-tidal, and terrestrial habitats; Cross-adaptation to different environment: air-breathing fish adaptations in mammals; Visual signals & differential levels of photoreception from protozoa to n Background adaptation: functions & mechanisms for color presentation; Sound wave as envir signals: functions & mechanisms of detection in aquatic & terrestrial habitats; Echo sounding ir navigation without visual signals; Behavioral, morphological & physiological adaptations i environment: extreme hot vs freezing cold; salinity changes in aquatic habitats & water avail terrestrial habitats on osmoregulation, water balance & nitrogenous metabolism.						nange for aquatic, ning fish vs diving ozoa to mammals; as environmental unding in bats for tations in hostile	
Course Learning Outcomes	On succe	ssful co	mpletion of this course, students	sho	uld be able to:			
	CLO 1 h	nave a b	road understanding on functiona	al inte	eractions between anima	ls and thei	r environment	
	CLO 2	apprecia	te the role of the environment in	sha	oing the evolution of anin	nal structur	es & functions	
			end a wide range of physiologic ronmental stress and environmental			ally & funct	tionally) in coping	
Pre-requisites (and Co-requisites and Impermissible combinations)			03 Biological sciences laborat istics or BIOL2306 Ecology and			rinciples o	f biochemistry or	
Offer in 2015 - 2016	Y 2nd	d sem			Exami	nation	May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the co learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thou, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effect organizational skills. Writings consistently demonstrate informed, thoughtful intellectual engagement with broad rate of relevant concepts.					ce of original thought, Apply highly effective	
	В	learnir knowle	nstrate substantial command of a broad ig outcomes. Show evidence of anal edge to familiar and some unfamilia instrate informed, thoughtful intellectual e	lytical ar situ	and critical abilities and logi lations. Apply effective orga	cal thinking, nizational sk	and ability to apply kills. Writings mostly	
	С	outcor to mo	nes. Show evidence of some analytical st familiar situations. Apply moderate	and c	ritical abilities and logical think ective organizational skills. V	nowledge required for attaining most of the course learning all abilities and logical thinking, and ability to apply knowledge we organizational skills. Writings mostly indicate informed, ot always with sufficient depth, breadth or understanding.		
	D	Show ability	nstrate partial but limited command of k evidence of some coherent and logica to apply knowledge to solve problems. intellectual engagement with concepts of	l think Apply	ing, but with limited analytical limited or barely effective org	and critical a anizational sl	abilities. Show limited	
	Fail	to sol	nstrate little or no evidence of commar of analytical and critical abilities, logical ve problems. Organizational skills are ctual engagement with concepts or theo	and co	pherent thinking. Show very litt imally effective or ineffective	le or no abilit . Writings re	ty to apply knowledge	
Course Type	Lecture-b	ased co	urse					
Course Teaching	Activitie	s		Det	ails		No. of Hours	
& Learning Activities	Lectures						36	
	Tutorials						12	
	Reading	/ Self st	udy				100	
Assessment Methods and Weighting	Methods	3	Details		Weighting in final course grade (%)		ssment Methods to CLO Mapping	
	Examina	tion			75	CL	O 1,2,3	
	Test		test & continual assessment		25	CL	O 1,2,3	
Required/recommended reading and online materials	(2) C. L. (3) R. W.	Stanfield Hill, G.	(2012) Essentials of Human And (2011) Principles of Human Pl A. Wyse & M. Anderson (2008) & P. M. Schulte (2008) Princip	hysic Anir	logy, Benjamin Cumming nal Physiology, Sinauer i	gs. Associate,	Inc., Sunderland	
Course Website	http://mod	odle.hku	.hk/					
Additional Course Information	Refer to t	he Webs	site of School of Biological Scier	nces.				

BIOL3107 Plant physiology	(6 credits)	Academic Year	2015
Offering Department	Biological Sciences	Quota	30
Course Co-ordinator	Dr W K Yip, Biological Sciences (wkyip@hku.hk)		
Teachers Involved	Dr W K Yip, Biological Sciences		
Course Objectives			

	To give a mechanis		ding of plant process	es such as pl	ant growth and develo	oment a	nd their regulatory		
Course Contents & Topics	signal tra	scovery, assay, chemical nature, mechanism, structure-activity relationships, physiological effects, and transduction of plant hormones. Hormonal transport. Selected topics on plant growth velopment including photo-morphogenesis, seed germination, dormancy, apical dominance, ening, leaf abscission, and plant defense.							
Course Learning Outcomes	On succe	ssful comple	tion of this course, stu	idents should	be able to:				
	CLO 1	understand	the study of plant biol	ogy using mut	ants in model plant Ara	bidopsis			
	CLO 2	CLO 2 understand biotechnological opportunities by manipulating plant gene expres							
	CLO 3	understand	the regulation of plant	growth and d	evelopment by various	plant ho	rmones		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	IOL2103 Bio	logical sciences labor	atory course					
Offer in 2015 - 2016	Y 1st	sem			Examina	tion	Dec		
Offer in 2016 - 2017	Y								
Course Grade	A+ to F								
Grade Descriptors	Α	A In written examination: Exceptionally good organization and presentation, the discussion would be very clearly written and show evidence of originality. In practical sessions: excellent insight in to the practical aims; submit good reports.							
	В	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		kamination and practical seation, and answers are larg		owledge and understanding o	f the subje	ect, a lack of coherent		
Course Type	Lecture w	ith laborator	y component course						
Course Teaching	Activitie	s		Details	S		No. of Hours		
& Learning Activities	Lectures						24		
	Laborato	ory					24		
	Tutorials						6		
	Reading	/ Self study					100		
Assessment Methods and Weighting	Methods	3	Details		Weighting in final course grade (%)		ssment Methods to CLO Mapping		
	Examina	tion			75	(CLO 1,2,3		
	Laborato	ry reports			25		CLO 3		
Required/recommended reading	P. J. Davi		mones: Physiology, B	iochemistry a	nd Molecular Biology (N	/lartinus	Nijhoff Publishers		
•	Lecturing	materials an	d journal articles will b	oe posted on \	WebCT				
and online materials Course Website	-	materials an odle.hku.hk/	d journal articles will l	oe posted on \	WebCT				

BIOL3108 Microbial physic	ology (6 credits)	Academic Year	2015
Offering Department	Biological Sciences	Quota	50
Course Co-ordinator	Dr A Yan, Biological Sciences (ayan8@hku.hk)	·	·
Teachers Involved	Dr A Yan, Biological Sciences		
Course Objectives	Microbes are amazing and important entities on earth. Know pharmaceutics, biotechnologies, diseases control, and biogrovides molecular basis for understanding of these important essential foundations for sub-disciplines of Microbiology, suc Microbiology. Upon completion, students will acquire fund microbial studies and be able to relate knowledge to various microbial studies.	eochemical processes. Micro t processes and applications, h as environmental, industria amental knowledge and me	obial Physiology and to serve as al, and medicinal
Course Contents & Topics	Serving as a fundamental course for the understanding Physiology is organized and presented in three themes: 'Micro Adaption'. Under these three themes, a broad range of his presented including: 'Microorganisms and their position in the the study of microbes', 'Microbial structures and function Generation', 'Central metabolism', and 'Regulation and control a coherent manner with a highly interactive tutorial session for will achieve a high quality, stimulating, and problem-based lea	obial Rules', 'Microbial Breath ighly educational and intere living world', 'Fundamental mas', 'Microbial growth and ol of metabolic Activities'. Top ollowing each of the topics su	n', and 'Microbial esting topics are nethodologies for control', 'Energy ics are taught in
Course Learning Outcomes	On successful completion of this course, students should be a	ble to:	

	CLO 1	apprecia	te the diversity of microbi	al metaboli	sms and the strate	gies for their ac	aptive responses	
	CLO 2	compreh	end the principles underl	ying the dy	namic nature of mid	crobial physiolo	gy	
	CLO 3	relate kn	owledge to practical appl	ication of m	nicrobes in industry	and medicine		
	CLO 4	develop	abilities to read and asse	ss scientific	c literature in microb	oiology area		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	BIOL2103	Biological sciences labo	ratory cour	rse			
Offer in 2015 - 2016	Y 1s	t sem			E	Examination	Dec	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	learnin	nstrate thorough mastery at ar ig outcomes. Show strong anal bility to apply knowledge to a v zational skills.	ytical and criti	ical abilities and logical t	thinking, with evide	ence of original thought,	
	В	learnin	nstrate substantial command or ng outcomes. Show evidence edge to familiar and some unfar	of analytical	and critical abilities a	ind logical thinking		
	С							
	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.							
	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.							
Course Type	Lecture-b	pased co	urse					
Course Teaching	Activities Details				No. of Hours			
& Learning Activities	Lectures						36	
	Tutorials	3					12	
	Project v	work					2	
	Reading	Reading / Self study					100	
Assessment Methods and Weighting	Method	s	Details		Weighting in fin		essment Methods to CLO Mapping	
	Assignm	nents				, 20 CI	O 1,2,3,4	
	Examina	ation			50		LO 1,2,3	
	Test		mid-term				LO 1,2,3	
Required/recommended reading and online materials	Prescott,	Primary Text Book: Prescott, Harley, and Klein's Microbiology, by Joanne M. Willey, Linda M. Sherwood, and Christopher J Voolverton, published by McGraw-Hill Supplementary Reading: On-line textbook of Bacteriology: Kenneth Tobar, U. of Wisconsin-Madison, Department of Bacteriology						
and online materials	Supplem On-line t	extbook		,	of Wisconsin-Mad	lison, Departm	ent of Bacteriology	
Course Website	Supplem On-line t	extbook o://www.t	of Bacteriology: Kennethextbookofbacteriology.ne	,	of Wisconsin-Mad	lison, Departm	ent of Bacteriology	
	Supplem On-line t URL (http://mo	extbook o://www.t odle.hku.	of Bacteriology: Kennethextbookofbacteriology.ne	t/)		· •		

BIOL3109 Environmental r	nicrobiol	ogy (6 credits)	Academic Year	2015					
Offering Department	Biologic	ological Sciences Quota 40							
Course Co-ordinator	Dr J D C	Or J D Gu, Biological Sciences (jdgu@hku.hk)							
Teachers Involved	Dr J D C	Gu, Biological Sciences							
Course Objectives	environr which t microor	To familarize students with the role of various microorganisms in natural process which affect ou 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 detail for their biochemical processes. Key concepts are illustrated with known examples and cases							
Course Contents & Topics	2. Contr 3. Micro 4. Micro	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 Training in laboratory and field microbiological research technique							
Course Learning Outcomes	On succ	essful completion of this course, students should be able to:							
CLO 1 understand a range of microorganisms in the environment in terms of their roles and for well as biochemical capability and host range									
	CLO 2 know the specific biochemical processes, enzymes involved and reactions carried by selective microorganisms and their distribution in the environment								

	CLO 3 apply the	e appropriate	e techniques in envir	onmenta	al and microbial resea	rch		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOL2103	Pass in BIOL2103 Biological sciences laboratory course						
Offer in 2015 - 2016	Y 2nd sem				Examin	ation	May	
Offer in 2016 - 2017	Υ				'		'	
Course Grade	A+ to F							
Grade Descriptors	learnii logica	ng outcomes. T I thinking, with	horough grasp of the sulevidence of original thou	bject matte ght. Apply	knowledge and skills req er. Show very strong analy highly effective lab skills a ons. Apply highly effective	tical and cri	tical abilities and high es. Critical use of data	
	learnii thinkir	ng outcomes. S ng. Apply effec	Substantial grasp of the	subject. S ques. Cori	and skills required for atta show evidence of analytica ect use of data of results	al and critica	al abilities and logical	
	outcor thinkir	mes. General b ng. Apply mode	out incomplete grasp of the erately effective lab skills	ne subject. and techi	skills required for attain Evidence of some analytic niques. Mostly correct but by effective organizational a	cal and critic some erron	al abilities and logical eous use of data and	
	Partia logica ability	I but limited gra I thinking, but	asp, with retention of som with limited analytical an	ne relevant d critical a	quired for attaining some information, of the subject bilities. Partially effective clusions. Apply limited or b	t. Evidence lab skills an	of some coherent and d techniques. Limited	
	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 with labo	ratory comp	onent course					
Course Teaching	Activities			Details	·		No. of Hours	
& Learning Activities	Lectures						24	
	Laboratory						24	
	Field work						2	
	Project work						2	
	Tutorials						4	
	Reading / Self study						100	
Assessment Methods and Weighting	Methods	Detail	s		Weighting in final course grade (%)		ssment Methods to CLO Mapping	
	Assignments				10	(CLO 1,2,3	
	Examination				50	(CLO 1,2,3	
	Laboratory repor	rts			25	(CLO 1,2,3	
	Presentation	includi	ng report		10	(CLO 1,2,3	
	Test				5	(CLO 1,2,3	
Required/recommended reading and online materials	(Pearson/Benjam R.M. Atlas and R 4th ed.) References Molecular Biology Julian Lewis, Mar	in Cumming Bartha: Mi / of the Cell tin Raff, Kei	s, 2009, 12th ed.) crobial Ecology: Fur - Fifth Edition by Bru th Roberts, Peter Wa	ndamenta ice Albei alter (De	D.P. Clark: Brock E als and Applications (tts, Alexander Johnso cember 2007) ey-Blackwell, 2009, 2	Benjamin n,	Ü	
Course Website	http://moodle.hku	.hk/						
Additional Course Information	This course will b	e offered su	bject to a minimum e	enrollme	nt number and availal	oility of tea	achers.	

BIOL3110 Environmental to	xicology (6 credits)	Academic Year	2015			
Offering Department	Biological Sciences	Quota	60			
Course Co-ordinator	Dr J D Gu, Biological Sciences (jdgu@hku.hk)					
Teachers Involved	Dr J D Gu, Biological Sciences Prof R S S Wu, 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 enzymes involved will be highlighted. Specific cases of toxicity will be presented and discussed.					
Course Contents & Topics						

	bioaccumu 2. Partition 3. Quantita 4. Emergir 5. Eliminat	llation and be ling and trantive toxicolories ag endocring ion of pollut	nemistry of pollutants an piomagnification nsformation of environmenta ogy using dose-response ap e-disrupting chemicals and ants from the environments of toxicity and review various	al polluta oproache carcinoge	nts es ens at molecular levels		toxic effects
Course Learning Outcomes	On succes	sful comple	tion of this course, students	should b	pe able to:		
	CLO 1 ui	nderstand fa	ate and distribution of chem	icals in v	arious compartments o	f the ecosy	stem
		nderstand to	oxicity through adsorption,	metaboli	ism, elimination and ta	rget site ar	nd quantitative
		•	nechanism of toxicity from s	pecific po	ollutants of choice		
		nderstand s	specific biochemical proces	ses and	enzymes involved in	pollutants	transformation
	CLO 5 ui	nderstand a	ppropriate techniques in en	vironmer	ntal cleaning up		
Pre-requisites (and Co-requisites and Impermissible combinations)		BIOL2103 ental chemis	Biological sciences labor try	atory co	ourse or ENVS3042	Pollution	or CHEM314
Offer in 2015 - 2016	Y 1st	sem			Examina	tion	Dec
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	learning out	nastery at an advanced level of comes. Thorough grasp of the su ing, with evidence of original thou to draw appropriate and insightful	bject matte ght. Apply	er. Show very strong analytic highly effective lab skills and	cal and critical techniques. (abilities and high Critical use of data
	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.						
	General but incomplete command of knowledge and skills required for attaining most of the course I outcomes. General but incomplete grasp of the subject. Evidence of some analytical and critical abilities and thinking. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of diresults to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.					bilities and logical s use of data and	
	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 wi	th laborator	y component course				
Course Teaching	Activities	.		Details			No. of Hours
& Learning Activities	Lectures						
	Laborator	у		laboratory, assignment; and seminar			36
	Reading /	Self study					100
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		nent Methods CLO Mapping
	Examinat	ion			60	CLO	1,2,3,4,5
	student-base		includes laboratory assignment, presentation	essment report, ons or	40	CLO	1,2,3,4,5
Required/recommended reading and online materials	W. Stumm 3rd ed.)	, J.J. Morga	mental Toxicology and Cher an: Aquatic Chemistry: Che Gu: Environmental Microbiol	mical Èq	ulibria and Rates in Na		s (Wiley, 1995
Course Website	http://mood	dle.hku.hk/					
					nt number and availabil		

BIOL3201 Food chemistry (6 credits)			
Biological Sciences	Quota	60	
Dr J C Y Lee, Biological Sciences (jettylee @hku.hk)			
Dr J C Y Lee, Biological Sciences			
	Biological Sciences Dr J C Y Lee, Biological Sciences (jettylee@hku.hk)	Biological Sciences Quota Dr J C Y Lee, Biological Sciences (jettylee@hku.hk)	

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	minor compone and chemical p for understandi	cover the components of food, nts such as enzymes, vitamins, r roperties of these important cons ng the reactions which occur du derstanding the methods used in	minerals, colorants, flatituents of foods are cring the production, p	avorants and a covered in det	additives. The physical ail, and form the basis		
		oratory sessions will cover analys gars and starches, enzymatic and					
Course Learning Outcomes	On successful of	ompletion of this course, students	s should be able to:				
	CLO 1 unders	tand the functions and properties	of major and minor fo	od component	:S		
	CLO 2 unders	tand the basic chemistry behind f	ood processing				
		ntegrated their knowledge of bio n context	logical and chemical	principles into	a food science and		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOC26	00 Basic biochemistry or BIOL22	20 Principles of bioch	emistry			
Offer in 2015 - 2016	Y 2nd sem			Examination	May		
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A 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.						
	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.						
	C 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.						
	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 conclusions.						
Course Type	Lecture with lab	oratory component course					
Course Teaching	Activities		Details	No. of Hours			
& Learning Activities	Lectures				24		
	Laboratory				24		
	Tutorials				6		
	Reading / Self	study			100		
	Reading / Self Methods	Details	Weighting in t		ssessment Methods to CLO Mapping		
					ssessment Methods		
	Methods			: (%)	ssessment Methods to CLO Mapping		
Assessment Methods and Weighting	Methods Assignments			30	ssessment Methods to CLO Mapping CLO 1,2,3		
	Methods Assignments Examination Test Fennema OR, F		course grade	30 50 20	ssessment Methods to CLO Mapping CLO 1,2,3 CLO 1,2,3		

BIOL3202 Nutritional bioc	hemistry (6 credits)	Academic Year	2015			
Offering Department	Biological Sciences Quota 10					
Course Co-ordinator	Dr E T S Li, Biological Sciences (etsli@hku.hk)					
Teachers Involved	Dr E T S Li, Biological Sciences					
Course Objectives	To introduce the fundamental concepts of nutrition through an integrated approach in discussing the interactions between diet and intermediary metabolism.					
Course Contents & Topics	Essential nutrients and their requirements. Energy balance and caloric value of foods. Metabolic control of macronutrient utilization. Nutritional impacts of hexoses, long chain polyunsaturated fatty acids and amino acids. Dietary recommendations.					
Course Learning Outcomes						

	On successfu	I completion of this course, stude	ents should be able to:				
	CLO 1 unde	erstand the concept of nutrient rec	quirements				
	CLO 2 explain how different organs coordinate to achieve metabolic control of glucose homeostasis						
	CLO 3 unde	erstand the metabolic pathways o	f various polyunsaturate	ed fatty acids			
	CLO 5 asse	CLO 5 assess the impacts of dietary inadequacy					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOL2	Pass in BIOL2220 Principles of biochemistry or BIOC2600 Basic biochemistry or MEDE2301 Life science					
Offer in 2015 - 2016	Y 1st sen	n		Examination	Dec		
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	р	permonstrate thorough grasp of the sub- roblem identification and solving. Show of ppropriate conclusions. Demonstrate high	outstanding ability to critically	analyze and interpret			
	ic		ubject matter covered. Show full ability on knowledge integration, probler nable ability to critically analyze and interpret scientific data and drawlective organization / writing skills.				
	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 data and draw proper conclusions. Demonstrate adequate organization / writing skills.						
	D Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Misunderstanding of the materials is not uncommon. Show limited ability on knowledge integration, problem identification and solving. Use elementary approaches to analyze and interpret scientific data and draw sometimes erroneous conclusions. Demonstrate basic organization / writing skills.						
	C p	Pail Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Show lack coherent and logical thinking, and minimal competence in problem solving. Fail to integrate information and iden problems. Seriously deficient in ability to analyze and interpret scientific data and draw conclusions. Demonstration or organization / writing skills.					
Course Type	Lecture-based	d course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures						
	Tutorials		tutorials/guided studies		36 12		
	Reading / Se	elf study			100		
Assessment Methods and Weighting	Methods	Details	Weighting in course grad	Weighting in final Asse course grade (%)			
	Assignments				_O 2,3,4,5		
	Examination			70 CL	O 1,2,3,4,5		
	Test			15 CI	_O 1,2,3,4		
Required/recommended reading and online materials	Champe P.C.	etabolic regulation: A Human Per , Harvey R.A. & Ferrier D.R. Lipp Macdonald I.A. & Roche H.M. Nu	incott's Illustrated Revie	ews: Biochemistry			
Course Website	http://moodle.			-,			
		•					

BIOL3203 Food microbiolog	y (6 cre	edits)	Academic Year	2015				
Offering Department	Biologic	Biological Sciences Quota 60						
Course Co-ordinator	Dr H S I	El-Nezami, Biological Sciences (elnezami@hku.hk)						
Teachers Involved	Dr H S I	El-Nezami, Biological Sciences						
Course Objectives	interacti	his course provides the key concepts and principles of food microbiology with special emphasis on the teraction between microorganisms and food., microbial food spoilage and foodborne diseases will be scussed in detail.						
Course Contents & Topics	significa	Detection and enumeration of microbes in foods, Factors that influence microbes in foods, Spores and their significance, Physical methods of food preservation, Chemical preservation and natural antimicrobials, Foodborne pathogens.						
Course Learning Outcomes	On succ	essful completion of this course, students should be able to:						
	CLO 1 describe methods for evaluating microorganisms and their products in foods							
	CLO 2 demonstrate an understanding of the causes of food spoilage, and predict response of microorganism that can spoil a given food							
	CLO 3 develop and implement appropriate measures to control the spoilage and pathogenic microorganisms in a food							
	CLO 4 demonstrate the ability to work in a team to investigate and solve problems in food microbiology							

Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	IOC2600 B	asic biochemistry or BIOL2	220 Princi	oles of biochemistry			
Offer in 2015 - 2016	Y 2nd	d sem			Examina	tion	May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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 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	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	critical abil	ate general but incomplete grasp ities and logical thinking with lim and analysis of data and results problems. Demonstrate moderate	ited competer to draw mod	nce in professional-level pro erately appropriate but som	blem solving etimes erron	g. Use lab skills and eous conclusions to	
	D							
	Fail	coherent a techniques	nte little or no grasp, with retention and logical thinking, and minimal and analysis of data and result s to real-world problems. Demons	l competence ts ineffectively	e in professional-level prob y, leading generally to inap	lem solving. propriate and	Use lab skills and d usually erroneous	
Course Type	Lecture w	ith laborato	ry component course					
Course Teaching	Activitie	Activities			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 (%)		sment Methods o CLO Mapping	
	Assignme	ents	seminars & continuous assessment		40	C	CLO 2,4	
	Examina	tion			40		CLO 1,2	
	Laborato	ry reports			20	С	CLO 1,3	
Required/recommended reading and online materials	Microbiolo Food Micr	ogy (ASM) F robiology: F	An Introduction, 2005, Tho Press, Washington, DC undamentals and Frontiers 3rd edition, American Soci	s, 2007, Ed	dited by Michael P. Do	yle, Larry	R. Beuchat, and	
Course Website	http://moo	dle.hku.hk/		-				

BIOL3204 Nutrition and the	life cyc	e (6 credits)	Academic Year	2015			
Offering Department	Biologic	ological Sciences Quota 7					
Course Co-ordinator	Dr E T S	Li, Biological Sciences (etsli@hku.hk)					
Teachers Involved	Dr E T S	Li, Biological Sciences					
Course Objectives	roles of	utritional needs vary throughout different stages of the life cycle. This course aims to cover the functional les of essential nutrients and highlight the nutritional concerns during specific times of growth evelopment, and aging.					
Course Contents & Topics	key issu that influ	eaching and learning will take place through an evidence-based approach and will be organized around ey issues: vitamin and mineral needs and their metabolism; physiological and psychological determinants nat influence nutrient requirements at different stages of the human life cycle; socio-economic factors that offluence dietary habit and nutritional status.					
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1 have fundamental knowledge of essential micronutrient metabolism						
	CLO 2 be able to critically assess and identify the specific needs at different stages of the life cycle						
	CLO 3 relate the concept of requirement to physiological needs						
	CLO 4 understand the impact of socio-cultural factors on nutritional status						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in biochem	BIOC2600 Basic biochemistry or BIOL2220 Principl stry	les of biochemistry or BIO	DL3202 Nutritional			
Offer in 2015 - 2016	Y 21	d sem	Examination	May			
Offer in 2016 - 2017	Υ						

Course Grade	A+ to F						
Grade Descriptors	prol	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 scientific data and draw appropriate conclusions. Demonstrate highly effective team-based organization and presentation skills.					
	ider	monstrate substantial grasp of the subj ntification and solving. Show reasonal propriate conclusions. Demonstrate effec	ole ability to critically analyze and i	nterpret scientific data and draw			
	mat ana	C 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 data and draw proper conclusions. Demonstrate adequately effective team-based organization and presentation skills.					
	Mis ider	D Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Misunderstanding of the materials is not uncommon. Show limited ability on knowledge integration, problem identification and solving. Use elementary approaches to analyze and interpret scientific data and draw sometimes erroneous conclusions. Demonstrate team-based organization and presentation skills of limited effectiveness.					
	coh	monstrate little or no grasp, with retention nerent and logical thinking, and minimal blems. Seriously deficient in ability to a or organization and presentation skills.	competence in problem solving. Fail to	integrate information and identify			
Course Type	Lecture-based	course					
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			
	Assignments		20	CLO 1,2,3			
	Essay		20	CLO 2,3,4			
	Cyaminatian		60	CLO 1,2,3,4			
	Examination			, ,-,			
Required/recommended reading and online materials	Brown J.E. Nuti Edelstein S. & 2009 Gropper S.S., S	rition Through the Life Cycle. The Sharlin J. Life Cycle Nutrition: A Smith J.L & Groff J.L. Advanced than & Sylvia Escott-Stump: Krat	An Evidence-based Approach. Nutrition and Human Metaboli	Jones & Bartlett Publishers			
reading	Brown J.E. Nutr Edelstein S. & 2009 Gropper S.S., S L. Kathleen Ma	Sharlin J. Life Cycle Nutrition: A Smith J.L & Groff J.L. Advanced han & Sylvia Escott-Stump: Krat	An Evidence-based Approach. Nutrition and Human Metaboli	Jones & Bartlett Publishers sm (Wadsworth, 2009)			

BIOL3205 Human physiolo	gy (6 cred	its)			Academic Year	2015			
Offering Department	Biological	Sciences			Quota	120			
Course Co-ordinator	Dr W Y Lu	ii, Biological Sciences	(wylui @hku.hk)			'			
Teachers Involved	Prof F C (or W Y Lui, Biological Sciences Prof F C C Leung, Biological Sciences Prof A O L Wong, Biological Sciences Or E T S Li, Biological Sciences							
Course Objectives	completin	ne course covers major aspects of the physiology of the human body using an integrated approach. After impleting this course, students will have acquired fundamental principles of how the body works. Students interested in nutrition and human biology will find this course most useful.							
Course Contents & Topics	system pl respirator	Overview of the physiological systems and homeostasis; Neural and hormonal communication; Nervou system physiology; The digestive system; Cardiac physiology, the blood vessels and blood pressure; The espiratory system; The urinary system; The skeletal & muscular system; Sensory mechanisms; Biological hythms; Central-peripheral communication in energy homeostasis.							
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 comprehend the essence of how the body meets changing conditions while maintaining a relatively constant internal environment								
	CLO 2 understand the functions of various body systems								
	CLO 3 explain normal body functions through integration of basic physiologic concepts								
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	OL2103 Biological scie	ences laboratory cou	urse					
Offer in 2015 - 2016	Y 1st	sem			Examination	Dec			
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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							

		and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effection organizational skills.					
	learr	ning outcomes. Show evidence of an	range of knowledge required for attaining at least most of the tical and critical abilities and logical thinking, and ability tations. Apply effective organizational skills.				
	outc	nonstrate general but incomplete commones. Show evidence of some analytic ost familiar situations. Apply moderately	al and critical abilities and logical think				
	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.						
	Lack	nonstrate little or no evidence of common k of analytical and critical abilities, logically plve problems. Organizational skills are					
Course Type	Lecture-based o	course					
Course Teaching & Learning Activities	Activities		Details	No. of Hours			
	Lectures			36			
	Tutorials			12			
	Reading / Self study						
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Examination		70	CLO 1,2,3			
	Test		30	CLO 1,2,3			
Required/recommended reading and online materials	Sherwood L.: Hu Johnson M. D.: Siegel G. J. et a	.: Human Physiology: An integra uman Physiology: From Cells to Human Biology (Pearson, 2006) I.: Basic Neurochemistry (Acade Myers A.K. Netter's Essential F	Systems (Thomson, 2007) emic Press, 2006)				
Course Website	http://moodle.hk	u.hk/					
Additional Course Information	This course will	be offered subject to a minimum	enrollment number and availa	ability of teachers			

BIOL3206 Clinical nutrition	n (6 credits	s)	Academic Year	2015						
Offering Department	Biological	Sciences	Quota	70						
Course Co-ordinator	Dr J M F	Wan, Biological Sciences (jmfwan@hku.hk)								
Teachers Involved	Dr J M F	Dr J M F Wan, Biological Sciences								
Course Objectives	dietetics, 1. Explair 2. Descri diabetes, 3. Differer	This course aims to provide understanding and insight into diseases associated with diet and ba dietetics, specifically to: 1. Explain the relationships between diet and disease. 2. Describe the role of diet in the development and prevention of common chronic diseases such diabetes, obesity and anorexia, cardiovascular disease, cancer, immune deficiency and renal failure. 3. Differentiate risk factors that influence dietary choice. 4. Describe the rationales for postoperative nutritional support for hospitalized patients.								
Course Contents & Topics	developm bulimia n	he basics of nutrition for health and fitness and medical nutrition therapy. The role of diet in the evelopment and prevention of chronic diseases such as cancer, diabetes, obesity and anorexia as well as ulimia nervosa, cardiovascular diseases, renal failure, etc. Malnutrition. Nutrition and immune function ledical nutrition therapy for food allergy and food intolerance. Nutrition in pregnancy and lactation.								
Course Learning Outcomes	On successful completion of this course, students should be able to:									
	CLO 1	CLO 1 discuss the different relationships between diet and disease								
	CLO 2 describe the role of diet in the development and prevention of diabetes, obesity and anorexia, cardiovascular disease, cancer, immune deficiency, and renal failure									
	CLO 3 clearly differentiate and interpret risk factors that influence dietary choice									
	CLO 4 describe the rationales for postoperative nutritional support for hospitalized patients									
Pre-requisites (and Co-requisites and Impermissible combinations)		BIOL3202 Nutritional biochemistry or BIOL3203 Food mi or BIOL3205 Human physiology	crobiology or BIOL3204	Nutrition and the						
Offer in 2015 - 2016	Y 2nd	d sem	Examination	May						
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Thorough grasp of the subject. 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 laboratory/fieldwork skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.								
	В									

abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Organization and presentational skills are minimally effective. Apply minimally effective or ineffective laboratory / fieldwork 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-based course Activities Details No. of Hours Lectures Tutorials Reading / Self study Details Weighting in final course grade (%) Assessment Methods and Weighting Assignments Examination Presentation Selected readings will also be available on the class website. S. Rodwell Williams: Nutrition and Diet Therapy (7th ed.) Suitor & Hunter: Nutrition: Principles and Application in Health Promotion Wardlaw Gordon: Perspectives in Nutrition (2nd ed.) Additional Course Information This course will be offered subject to a minimum enrollment number and availability of teachers.		C Demo learni abilitii organ correctorgan D Demo outco evidei apply partia conclt Fail Demo outco outco	unfamiliar situations. Apply effective skills and techniques. Correct use of and presentational skills. juired for attaining most of the course idence of some analytical and critical situations. Apply moderately effective / fieldwork skills and techniques. Mostly onclusions. Apply moderately effective or attaining some of the course learning want information of the subject. Show dicritical abilities. Show limited ability to attoinal and presentational skills. Apply e data and results to draw appropriate skills.					
Course Teaching & Lectures Lectures Tutorials Reading / Self study Methods Details Weighting in final course grade (%) Assessment Methods and Weighting Assignments Examination Presentation Required/recommended reading and online materials Course Website Activities Details Details Weighting in final course grade (%) Weighting in final course grade (%) CLO 1,2 Examination Assessment Methods to CLO Mapping CLO 1,2 Examination CLO 1,2,3,4 Presentation Selected readings will also be available on the class website. S. Rodwell Williams: Nutrition and Diet Therapy (7th ed.) Suitor & Hunter: Nutrition: Principles and Application in Health Promotion Wardlaw Gordon: Perspectives in Nutrition (2nd ed.) Course Website		Orgar labora concli	nization and presentational skills are a story / fieldwork skills and techniquusions. Organization and presentations	minimally effective or ineffective. es. Misuse of data and results	Apply minimally effective or ineffective and/or unable to draw appropriate			
& Learning Activities Lectures Tutorials Reading / Self study Methods Assessment Methods and Weighting Methods Details Weighting in final course grade (%) Assignments Examination Examination Presentation Required/recommended reading and online materials Course Website Assessment Methods to CLO Mapping Course grade (%) Assessment Methods to CLO Mapping Course grade (%) Selected readings will also be available on the class website. S. Rodwell Williams: Nutrition and Diet Therapy (7th ed.) Suitor & Hunter: Nutrition: Principles and Application in Health Promotion Wardlaw Gordon: Perspectives in Nutrition (2nd ed.) No. of Hours Assessment Methods to CLO Mapping CLO 1,2,3,4 Presentation Selected readings will also be available on the class website. S. Rodwell Williams: Nutrition and Diet Therapy (7th ed.) Suitor & Hunter: Nutrition: Principles and Application in Health Promotion Wardlaw Gordon: Perspectives in Nutrition (2nd ed.) No. of Hours Assessment Methods to CLO Mapping CLO 1,2,3,4 Presentation Selected readings will also be available on the class website. S. Rodwell Williams: Nutrition and Diet Therapy (7th ed.) Suitor & Hunter: Nutrition: Principles and Application in Health Promotion Wardlaw Gordon: Perspectives in Nutrition (2nd ed.)	7.	Lecture-based co	ourse					
Lectures 36 Tutorials 12 Reading / Self study 100 Assessment Methods and Weighting Methods and Weighting Methods and Weighting Methods and Weighting Methods Methods and Weighting Methods Me		Activities		Details	No. of Hours			
Assessment Methods and Weighting Methods Details Weighting in final course grade (%) Assessment Methods to CLO Mapping Assignments Examination Presentation Required/recommended reading and online materials Course Website Methods Details Weighting in final course grade (%) CLO 1,2 CLO 1,2 CLO 1,2 CLO 1,2,3,4 CLO 1,2,3,4 Selected readings will also be available on the class website. S. Rodwell Williams: Nutrition and Diet Therapy (7th ed.) Suitor & Hunter: Nutrition: Principles and Application in Health Promotion Wardlaw Gordon: Perspectives in Nutrition (2nd ed.) http://moodle.hku.hk/	a Learning Addivides	Lectures			36			
Assessment Methods and Weighting Methods Details Weighting in final course grade (%) Assessment Methods to CLO Mapping Assignments Examination Examination Presentation Course Website Methods Details Weighting in final course grade (%) CLO 1,2 CLO 1,2 CLO 1,2,3,4 CLO 1,2,3,4 CLO 1,2,3,4 Selected readings will also be available on the class website. S. Rodwell Williams: Nutrition and Diet Therapy (7th ed.) Suitor & Hunter: Nutrition: Principles and Application in Health Promotion Wardlaw Gordon: Perspectives in Nutrition (2nd ed.) http://moodle.hku.hk/		Tutorials			12			
and Weighting Assignments Assignments Examination Presentation Required/recommended reading and online materials Course Website Methods Course grade (%) Assignments Course Website Course Website Assignments Course Weighting in Haal to CLO Mapping CLO 1,2 CLO 1,2 CLO 1,2,3,4 CLO 1,2,3,4 Presentation Selected readings will also be available on the class website. S. Rodwell Williams: Nutrition and Diet Therapy (7th ed.) Suitor & Hunter: Nutrition: Principles and Application in Health Promotion Wardlaw Gordon: Perspectives in Nutrition (2nd ed.) http://moodle.hku.hk/		Reading / Self study			100			
Examination 60 CLO 1,2,3,4 Presentation 20 CLO 1,2,3,4 Required/recommended reading and online materials Course Website Sxmooth Symbol Symbo		Methods	Details					
Presentation 20 CLO 1,2,3,4 Required/recommended reading and online materials Course Website Presentation 20 CLO 1,2,3,4 Selected readings will also be available on the class website. S. Rodwell Williams: Nutrition and Diet Therapy (7th ed.) Suitor & Hunter: Nutrition: Principles and Application in Health Promotion Wardlaw Gordon: Perspectives in Nutrition (2nd ed.) http://moodle.hku.hk/		Assignments		20	CLO 1,2			
Required/recommended reading and online materials Course Website Selected readings will also be available on the class website. S. Rodwell Williams: Nutrition and Diet Therapy (7th ed.) Suitor & Hunter: Nutrition: Principles and Application in Health Promotion Wardlaw Gordon: Perspectives in Nutrition (2nd ed.) http://moodle.hku.hk/		Examination		60	CLO 1,2,3,4			
reading and online materials S. Rodwell Williams: Nutrition and Diet Therapy (7th ed.) Suitor & Hunter: Nutrition: Principles and Application in Health Promotion Wardlaw Gordon: Perspectives in Nutrition (2nd ed.) Course Website http://moodle.hku.hk/		Presentation		20	CLO 1,2,3,4			
· ·	reading	S. Rodwell Willi	S. Rodwell Williams: Nutrition and Diet Therapy (7th ed.) Suitor & Hunter: Nutrition: Principles and					
Additional Course Information This course will be offered subject to a minimum enrollment number and availability of teachers.	Course Website	http://moodle.hku	ı.hk/					
	Additional Course Information	This course will b	e offered subject to a minimum	enrollment number and av	ailability of teachers.			

BIOL3207 Food and nutrition	onal toxi	cology (6 credits)		Academic Year	2015				
Offering Department	Biologic	Biological Sciences Quota 80							
Course Co-ordinator	Dr H S I	I-Nezami, Biological Sciences (elnezami@hku.hk))						
Teachers Involved	Dr H S I	Dr H S El-Nezami, Biological Sciences							
Course Objectives	confider basic co nondieta toxicokii	To introduce students to methods used in assessing the toxicity of food contaminants, and to develop their confidence in the handling and interpretation of toxicological data. Students will also be introduced to the basic concepts behind toxicological evaluation, and the criteria for setting guidance values for dietary and nondietary exposure to chemicals. Students will understand the role of biochemical, metabolic and toxicokinetic studies in toxicological evaluation. This course aims to equip students with basic skills in conducting food toxicological studies.							
Course Contents & Topics	(toxicok substan	opics include a discussion on exposure and entry routes, fates of toxic substances in the body oxicokinetics), concepts in experimental toxicology, the dose response relationship, actions of toxic ubstances, target organ effects, the actions and types of carcinogens. A survey of the health effects common classes of toxic substances is also presented.							
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 demonstrate an understanding of the processes involved in absorption, distribution, metabolism and excretion of toxicants, including an understanding of the toxicokinetic behavior of toxicants in mammals								
	CLO 2 demonstrate an understanding of the various effects induced after exposure to toxicants								
	CLO 3 demonstrate an understanding of the factors which underlie species differences in response to potential toxicants								
	CLO 4 demonstrate the ability to work in a team to investigate and solve toxicological problems of importance in human health								
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in physiolo	BIOC2600 Basic biochemistry or BIOL2220 P gy	rinciples of	biochemistry or B	IOL3205 Humar				
Offer in 2015 - 2016	Y 2	d sem		Examination	May				
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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 lat							

		skills and techniques and analysis of data and results to draw appropriate and insightful conclusion 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	critical abili	te general but incomplete grasp ties and logical thinking with limite and analysis of data and results to problems. Demonstrate moderately	ed competer o draw mod	nce in professional-level pro- lerately appropriate but some	olem solving. Use lab skills and etimes erroneous conclusions to	
	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 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	Lecture wit	h laborato	y component 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	
	Assignments		seminars & continuou assessment		40	CLO 2,4	
	Examination				40	CLO 1,2,3	
	Laboratory reports				20	CLO 2	
Required/recommended reading and online materials	S. S. Desh	S. S. Deshpande: Handbook of Food Toxicology (Marcel Dekker Inc., NY, 2002)					
Course Website	http://mood	lle.hku.hk/					
Additional Course Information	This course	his course will be offered subject to a minimum enrollment number and availability of teachers.					

BIOL3208 Food safety and	quality	management (6 credits)		Academic Year	2015				
Offering Department	Biologi	cal Sciences		Quota	40				
Course Co-ordinator	Prof H	Corke, Biological Sciences (harold@hku.hk)							
Teachers Involved	Prof H	Corke, Biological Sciences							
Course Objectives	that wi	To provide exposure to some key management concepts used to produce safe high-quality food products that will succeed in the marketplace. To introduce students to analysis and problem-solving of realistic business situations in food safety management.							
Course Contents & Topics	- Basic - Statis - Qualif - Qualif - Deve ISO 22 - Role - Intelle - Religi	- 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 Point (HACCP) plan (within a ISO 22000 food safety management system/ supply chain approach) - Role of environmental management systems (ISO 14000) in the food industry - Intellectual Property issues in the food industry - Religious, ethical, and cultural food choices - Illustrative business case studies on food safety management will be discussed							
Course Learning Outcomes	On suc	cessful completion of this course, students should be a	ble to:						
	CLO 1 understand the historical development of government regulation of food safety								
	CLO 2 be familiar with a set of management techniques applicable in the food industry								
	CLO 3 be able to analyze food production problems and make recommendations for action to improve quality and safety								
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	Pass in BIOL3201 Food chemistry or BIOL3203 Food microbiology							
Offer in 2015 - 2016	Y	st sem		Examination	Dec				
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors									

	t t	thinking, managei	trate thorough grasp of the subject with evidence of creative ability and ment skills and techniques and anal Id problems. Demonstrate highly effe	l compe sis of d	tence in professional-level pro ata and results to draw approp	blem solving. Critically use quality oriate and insightful conclusions to		
	-	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 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 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.						
		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.						
	1	Pail 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 quality management 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	Lecture-base	ed cour	se					
Course Teaching	Activities			Deta	ails	No. of Hours		
& Learning Activities	Lectures					36		
	Tutorials			inclu	iding presentation	12		
	Group work					30		
	Reading / Self study					100		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignment	s			10	CLO 2		
	Examination	ı			60	CLO 1,2,3		
	Project repo	rts	including presentation		30	CLO 2,3		
Required/recommended reading and online materials	Mortimore, S	and V	Safety (Eagan Press, 1992) Wallace, C.: HACCP: A Pract Microbiology of Safe Food (:					
Course Website	http://moodle	hku.h	k/					

BIOL3209 Food and nutrie	nt analys	sis (6 credits)			Academic Year	2015	
Offering Department	Biologic	Biological Sciences Quota				70	
Course Co-ordinator	Dr M F	Wang, Biological	Sciences (mfwang@	Phku.hk)			
Teachers Involved		Wang, Biological ′ Lee, Biological					
Course Objectives	to unde	To introduce basic principles and provide practical training in food and nutrient analysis. To help studen to understand the principles behind analytical instruments used in food analysis. To train students analyze major and minor food components as well as some food adulterants.					
Course Contents & Topics	technique and add	The key concepts in professional food analysis in an industry context will be introduced. Basic analytic techniques for macronutrients (e.g. protein, carbohydrate and fats), micronutrients (vitamins and mineral and adulterants in food will be covered. A variety of classical and instrumental techniques used in for analysis will be discussed: rheology and texture measurement, thermal analysis, color, spectroscopy chromatography and electrophoresis.					
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1 understand the basic principles of food and nutrient analysis						
	CLO 2 be familiar with a variety of classical and instrumental analytical techniques						
	CLO 3 understand the principles behind analytical instruments associated with food						
	CLO 4 be able apply their knowledge and laboratory skills in novel situations to measure and analyze the macronutrient and micronutrient of food products						
	CLO 5 be able to select and justify an appropriate analytical technique to solve practical food analysis problems						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	BIOL3201 Food	chemistry				
Offer in 2015 - 2016	Y 1	st sem			Examination	Dec	
Offer in 2016 - 2017	Y						
Course Grade	A+ to F						

Grade Descriptors	th sk	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.						
	lo	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.						
	cr te	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 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.						
	Si Us	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.						
	co	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	Lecture with la	aboratory component course						
Course Teaching	Activities		Details	No. of Hours				
& Learning Activities	Lectures			24				
	Laboratory			24				
	Tutorials			6				
	Reading / Sel	If study		100				
Assessment Methods and Weighting								
and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping				
and Weighting	Methods Assignments	Details practical work & assignment						
and Weighting			course grade (%)	to CLO Mapping				
and Weighting Required/recommended reading and online materials	Assignments Examination Y. Pomeranz ed.)		course grade (%) 40 60 Theory and Practice (Van N	to CLO Mapping CLO 1,2,3,4,5 CLO 1,2,3,4,5 ostrand Reinhold, 1994, 3rd				
Required/recommended reading	Assignments Examination Y. Pomeranz ed.)	practical work & assignment and C.E. Meloan: Food Analysis: Introduction to the Chemical Analysis	course grade (%) 40 60 Theory and Practice (Van N	to CLO Mapping CLO 1,2,3,4,5 CLO 1,2,3,4,5 ostrand Reinhold, 1994, 3rd				

BIOL3210 Grain production	n and uti	lization (6 credits)	Academic Year	2015				
Offering Department	Biologic	al Sciences	Quota	40				
Course Co-ordinator	Prof H (Corke, Biological Sciences (harold@hku.hk)						
Teachers Involved	Prof H (Corke, Biological Sciences						
Course Objectives		To provide a broad understanding of the utilization and significance of the major grains in the food including and in human health and nutrition.						
Course Contents & Topics	- The G - Interna - Wheat - Wheat - Wheat - Rice: r - Maize: - Biofue	- Global grain production and consumption - The Green Revolution and its aftermath - International grain trade - Wheat: flour milling, dough rheology, the baking process, baking quality - Wheat: quality of Asian products including steamed bread and noodles - Wheat: small-scale tests for quality - Rice: nutritional quality, consumer preferences, milling, quality, quality testing, products - Maize: products of wet milling, animal feed development - Biofuels focusing on bioethanol - Illustrative business case studies on the grain processing industry will be discussed						
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 understand the major production, import, and export patterns that support the global utilization of grain							
	CLO 2 understand the technology behind the production of grain-based foods							
	CLO 3	CLO 3 understand the scope and nature of professional level quality testing for grain products						
	CLO 4	CLO 4 appreciate the constraints to global food sufficiency						
	CLO 5 appreciate the ethical issues behind the diversion of grain into meat and biofuel production							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	any level 2 BIOL course						
Offer in 2015 - 2016	Y 1	st sem	Examination	Dec				
Offer in 2016 - 2017	Υ		,					
Course Grade	A+ to F							

Grade Descriptors	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	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	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	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	Lecture-bas	sed cour	se					
Course Teaching	Activities			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		
	Examination	n			70	CLO 1,2,3,4,5		
	Project reports		in aludina area entation	30		CLO 2,3		
	Project rep	0113	including presentation		30	CLO 2,3		
Required/recommended reading and online materials	Encycloped	ia of Gr vier, Ox	ain Science, edited by Wrigle ford. (selected chapters only)	y CW, Corke		- ,-		
reading	Encycloped pages. Else	lia of Grevier, Ox ngs to b	ain Science, edited by Wrigle ford. (selected chapters only) e provided	y CW, Corke		- ,-		

BIOL3211 Nutrigenomics (6	credits)	Academic Year	2015				
Offering Department	Biologic	Biological Sciences Quota						
Course Co-ordinator	Dr K C	Tan-Un, Biological Sciences (kctanun@hku.hk)						
Teachers Involved	Dr K C	Tan-Un, Biological Sciences						
Course Objectives	science biochen related	Recent advances in the understanding of the human genome have resulted in the emergence of a necicience called Nutrigenomics. This course aims to provide students with an understanding of the biochemical mechanisms underpinning the science of nutrition and the relation between genes and discleded diseases. It explains the role of nutrition at the molecular level and the concepts of nutrigenominal nutrigenetics.						
Course Contents & Topics	Regulat Overvie Relevar Epigene predispo Polyuns oxidatio	Concepts of nutrigenomics, nutrigenetics, metabolomics and nutritional biochemistry. Regulation of gene expression; Single Nucleotide Polymorphisms and relation to diseases. Overview of lipid metabolism; cholesterol metabolic pathway; hyperlipidaemia, LDL receptor mutations. Relevance of folate, vitamin B12; hyperhomocysteinemia and gene polymorphisms in diseases. Epigenetics, Barker s hypothesis, influence of maternal nutrition in fetal gene expression. Obesity, genet predisposition, candidate genes like leptin, FTO and other hormones involved in the control of appetite Polyunsaturated fatty acid and their roles in the control of gene expression example lipogenesis and lipoxidation pathways; Inborn errors of metabolism in the context of genetic mutations and personalized diet therapy						
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 explain the principles of the control of gene expression							
	CLO 2 demonstrate understanding of the role of metabolic pathways in relationship to diet, gene expression and disease							
	CLO 3 discuss how genetic variations are used to study the role of genes in nutrient-related cellular processes							
	CLO 4	explain the relationship between genotype, epigenetics and	diet-related diseases					
	CLO 5	critically evaluate current theories of personalized nutrition b	ased on individual ge	enetic variation				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	BIOC2600 Basic biochemistry or BIOL2220 Principles of bioc	hemistry					
Offer in 2015 - 2016	Y 2	nd sem	Examination	May				
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							

Grade Descriptors	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.							
	prob	Demonstrate marginal grasp of the subject matter covered. Show limited ability on knowledge integration and problem solving skills. Show limited ability to analyse and interpret scientific data. Demonstrate basic organization and writing skills.						
	and Sho	nonstrate little or no grasp, with little reten logical thinking, and minimal evidence in little or minimal ability to analyze an unization and writing skills.	n problem solving. Fail to integrate	information and identify problems.				
Course Type	Lecture-based of	course						
Course Teaching	Activities		Details	No. of Hours				
& Learning Activities	Lectures			36				
	Tutorials		student-centered learning	12				
	Reading / Self study							
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		60	CLO 1,2,3,4,5				
	Test		20	CLO 1				
Required/recommended reading and online materials	Ordovas: Nutrig Brigelius-Flohe, Rimbach, Fuchs	iples of Biochemistry enetics and Nutrigenomics. Wiley Joost: Nutritional Genomics. Wile s, Packer: Nutrigenomics, CRC P ition, Molecular Biology and Gene	ey. 2006. ress. 2005					
Course Website	http://moodle.hk	:u.hk/						
Additional Course Information	This course will	be offered subject to a minimum	enrollment number and availa	bility of teachers.				

BIOL3301 Marine biology (6 credits		Academic Year	2015				
Offering Department	Biologic	al Sciences	Quota	40				
Course Co-ordinator	Dr M Ya	asuhara, Biological Sciences (yasuhara@hku.hk)						
Teachers Involved	Prof Y S	asuhara, Biological Sciences Sadovy, Biological Sciences S S Wu, Biological Sciences ngatesen, Biological Sciences						
Course Objectives	diversity benefits	To develop a basic understanding and appreciation of the field of marine biology, including the fascinat diversity of marine life, their function, ecology and inter-relationships. Contemporary issues including benefits we derive from marine biological resources and threats to their long-term sustainability will also discussed with case studies highlighting key issues.						
Course Contents & Topics	1. The part temperary 2. Important mamma 3. Major mangrov 4. Explos. 5. Contest of temperary 1. Explosion for the part of the	The topics cover: 1. The physical and chemical environments (e.g., light, current, atmospheric -ocean interactions, salinity temperature, pH, dissolved oxygen, nutrients) and how these may affect the marine biota 2. Important groups of marine organisms (e.g., phytoplankton, zooplankton, benthos, nekton, marine mammals) and marine food web 3. Major marine habitats and ecosystems (e.g., intertidal, benthic, pelagic, deep sea, coral reefs mangroves) 4. Exploitation of marine biological resources (e.g., fisheries and bioactive compounds) 5. Contemporary issues (e.g. climate change, marine pollution, sustainable use of marine living resources invasive species)						
	On successful completion of this course, students should be able to:							
Course Learning Outcomes	On succ	essiui completion of this course, students should be able	to:					
Course Learning Outcomes	_	demonstrate a basic understanding of the diversity and f		g				
Course Learning Outcomes	CLO 1		unction of marine biota					
Course Learning Outcomes	CLO 1 CLO 2	demonstrate a basic understanding of the diversity and f	unction of marine biota onments					
Course Learning Outcomes Pre-requisites (and Co-requisites and Impermissible combinations)	CLO 1 CLO 2 CLO 3	demonstrate a basic understanding of the diversity and f recognize the interactions of marine biota and their envir appreciate the importance of marine ecosystems and	unction of marine biota onments the threats of human a					
Pre-requisites (and Co-requisites and	CLO 1 CLO 2 CLO 3	demonstrate a basic understanding of the diversity and f recognize the interactions of marine biota and their envir appreciate the importance of marine ecosystems and long-term sustainability as well as possible solutions	unction of marine biota onments the threats of human a					
Pre-requisites (and Co-requisites and Impermissible combinations)	CLO 1 CLO 2 CLO 3	demonstrate a basic understanding of the diversity and f recognize the interactions of marine biota and their envir appreciate the importance of marine ecosystems and long-term sustainability as well as possible solutions BIOL2306 Ecology and evolution or ENVS2002 Environm	unction of marine biota conments the threats of human a nental data analysis	activities on their				

Grade Descriptors	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.							
	learn	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.						
	outco limite	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.						
	outco	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 with labor	oratory component course						
Course Teaching & Learning Activities	Activities		Details	No. of Hours				
& Learning Activities	Lectures			24				
	Field work		field trip, laboratory pra tutorials	ictical &	30			
	Reading / Self s	100						
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	A	ssessment Methods to CLO Mapping			
	Assignments		20		CLO 1,2,3			
	Examination		80		CLO 1,2,3			
Required/recommended reading and online materials	Levinton, J. S. 2001. Marine Biology; function, biodiversity, ecology 2nd edition. 515 pp. Oxford University Press Nybakken, J.W. and Bertness, M.D., 2004. Marine Biology: An Ecological Approach, 6th Editio Benjamin Cummings. H. V. Thurman and E. A. Burton: Introductory Oceanography (Prentice Hall, 2001, 9th ed.) J. W. Nybakken: Marine Biology: An Ecological View (Benjamin Cummings, 2000) TBC							
Course Website	http://www.biosc	h.hku.hk/ecology/lsc/						

BIOL3302 Systematics and	phyloge	enetics (6 credits)	Academic Year	2015					
Offering Department	Biologic	al Sciences	Quota	60					
Course Co-ordinator	Prof R N	M K Saunders, Biological Sciences (saunders@hku.hk)							
Teachers Involved	Prof R N	Prof R M K Saunders, Biological Sciences							
Course Objectives	of curre (includir wide ra	To give students an understanding of the principles of systematics and phylogenetics and an appreciati of current trends and controversies. Systematics forms an invaluable grounding for many fields of biolog (including anatomy, ecology, population biology and evolutionary biology), and enables the integration owide range of techniques (including anatomy, biochemistry, chemistry, molecular biology, cytological palaeontology and ethology).							
Course Contents & Topics	cladistic anatomy complex nomeno	Currrent classificatory theories: phenetic systematics (classifications based on overall resemblances) are cladistics (evolutionary reconstruction). The species concept. Sources of taxonomic data: morphology anatomy, biochemistry, chemistry, molecular biology, cytology, and ethology. Causes of taxonomic complexity: environmental factors; hybridization; breeding systems. Principles nomenclature. Laboratory sessions will be aimed at illustrating taxonomic procedures and problem students will not be expected to memorize large numbers of scientific names.							
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 explain taxon concepts (with particular reference to species) and show how multivariate statistical methods can be applied below the species level								
	CLO 2 describe the principles behind maximum parsimony methods of phylogenetic reconstruction (including sister-group relationships, out-group comparison, homoplasy and the assessment of clade stability)								
	CLO 3 evaluate the diversity of sources of taxonomic data, and explain the importance of specific data sources								
	CLO 4 recognise the main causes of taxonomic complexity, and identify appropriate solutions								
	CLO 5 understand the principles of nomenclature in order to interpret the previous application of scientific names are validly publish new names								
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	BIOL1309 Evolutionary diversity and any level 2 BIOL cours	Э						
Offer in 2015 - 2016	Y 1	st sem	Examination	Dec					
Offer in 2016 - 2017	Υ								

Course Grade								
Grade Descriptors	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.						
	В	B 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	C 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 critical 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	outcomes, abilities and	with no evidence of backgr d logical thinking. Presentat priate conclusions. Little o	ound reading or i ional skills are m	use of named examples. Sho inimally effective or ineffectiv	or attaining the course learning w little or no evidence of critical e. Misuse of data and results to eories, principles, evidence and		
Course Type	Lecture wi	ith laborator	ry component course					
Course Teaching	Activities			Details	S	No. of Hours		
& Learning Activities	Lectures					24		
	Lectures					24		
	Laborator	ry				24		
		,						
	Laborator Project w	,				24		
Assessment Methods and Weighting	Laborator Project w	/ork / Self study	Details		Weighting in final course grade (%)	24 12		
	Laborator Project w Reading	/ork / Self study	Details			12 100 Assessment Methods		
	Laborator Project w Reading	vork / Self study s	Details		course grade (%)	24 12 100 Assessment Methods to CLO Mapping		
	Laborator Project w Reading / Methods Assignme Examinat	vork / Self study s	Details		course grade (%)	24 12 100 Assessment Methods to CLO Mapping CLO 1,3,4,5		
	Laborator Project w Reading / Methods Assignme Examinat Laborator E. Mayr &	orork / Self study sents tion ry reports P. D. Ashlo	ock: Principles of Syste		course grade (%) 15 70	24 12 100 Assessment Methods to CLO Mapping CLO 1,3,4,5 CLO 1,2,3,4,5 CLO 1,3		

BIOL3303 Conservation ed	cology (6	credits)	Academic Year	2015
Offering Department	Biologic	al Sciences	Quota	40
Course Co-ordinator	Dr T C I	Bonebrake, Biological Sciences (tbone@hku.hk)		
Teachers Involved	Prof Y S Dr T Ve	Bonebrake, Biological Sciences Badovy, Biological Sciences ngatesen, Biological Sciences rczmarski and TBC, Biological Sciences		
Course Objectives	understa biology. the best	duce students to the theory and practice of conservation and ingo of practical, economic and management skills. Our ultimate aim is to promote an understanding of the tways to manage them. We hope these will be your air defined by the course to reduce the local course the local course to reduce the local course the loc	s required for proficiency ne natural biodiversity, the ms too, and that you will be	in conservation threats to it, and a sale to use the
Course Contents & Topics	loss is generat also promanage orientate to a doelement. The coconserved conserved that are	the many environmental issues, the most serious is the irreversible on a human timescale and will reduce tools. Conservation Biology/Ecology is the science of povides insights to the many benefits and services that the ment options to sustain ecological integrity and proceed, multidisciplinary science which, like medicine, has bector, it matters whether the patient lives or dies. It is a serious from ecology, environmental science, forestry, resource urse is designed to provide the knowledge, theoritation. Our teaching focuses on biodiversity conservation. Our teaching focuses on biodiversity conservation legislation and economics. We emphasis on the integrity of the provide to practice conservation. Our problem based participate in their group project/class room debate by re-	the options available to a preserving biological diverse t nature offers and explored duction. It is an inexact, a util-in values: to a conservatalso a very new science, be management and many ties, and research related ation, conservation issues ersity conservation and ar integration of knowledge, so the learning approach will reconserved.	all future human sity. This course es strategies for applied, mission- ation biologist, as oringing togethe other fields. If to biodiversity associated with introduction to skills and abilities
Course Learning Outcomes	On succ	essful completion of this course, students should be abl	e to:	
	CLO 1	develop a framework for critical thinking about biodivers	sity, environment and huma	an interaction
	CLO 2	understand why species are becoming extinct and pred	dict which ones will be mos	t vulnerable

	aı		nd the importance of the threat tragmentation in species sity loss					
	m	CLO 4 understand the principles of population viability analysis, the basis of single-species conservation management and the role of ex situ conservation, ecological restoration and reintroduction in conservation						
	CLO 5 or	utline th	ne legal and administrative b	asis for conservation in	Hong Kong and	the wo	orld	
			te the roles and relationshi	ps of economic, social	and environm	ental s	ciences in the	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Blo	Pass in BIOL2306 Ecology and evolution						
Offer in 2015 - 2016	Y 2nd	sem			Examination	า	May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	course though familia	nstrate thorough mastery at an ac learning outcomes. Show strong at, ability to integrate and synthesis r and unfamiliar situations. Apply ntful and reflective thinking.	analytical and critical abilities se information, and ability to a	and logical thinkin apply knowledge to	g, with e	vidence of original range of complex,	
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at lea course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, materials and ability to apply knowledge to familiar and some unfamiliar situations. Demons presentational skills. Evidence of clear attention to thoughtful and reflective thinking					ing, integration of	
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and abilit knowledge to most familiar situations. Apply moderately effective presentational skills. Little evidence attention to thoughtful and reflective thinking.					nd ability to apply	
	D	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course le outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilitil little attempt at integration. Show limited ability to apply knowledge to solve problems. Apply limited effective presentational skills. Lack of attention to thoughtful and reflective thinking.					ritical abilities and	
	Fail	outcon	nstrate little or no evidence of cor nes. Lack of analytical and critical edge to solve problems. Organization	abilities, logical and coherent	thinking. Show ver	y little or	no ability to apply	
Course Type	Lecture with	th labor	ratory component course					
Course Teaching	Lecture wit		ratory component course	Details			No. of Hours	
Course Teaching			ratory component course	Details			No. of Hours	
Course Teaching	Activities	\$	atory component course	Details				
Course Teaching	Activities Lectures	s k	atory component course	Details			24	
**	Activities Lectures Field work	s k	atory component course	Details			24 10	
	Activities Lectures Field work Group wo	k ork		Details			24 10 8	
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Field work Group wo Tutorials	k ork ′ Self sti		Details Weighting in course grad			24 10 8 14	
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Field work Group wo Tutorials Reading /	k ork 'Self stu	udy	Weighting in	e (%)	to	24 10 8 14 100 ment Methods	
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Field work Group wo Tutorials Reading / Methods	k k ork ' Self stu	udy	Weighting in	e (%) 20 C	to CLO 1,2	24 10 8 14 100 ment Methods CLO Mapping	
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Field work Group wo Tutorials Reading / Methods Assignme	k k rk ' Self stu ents ion	udy	Weighting in	20 C	to CLO 1,2	24 10 8 14 100 ment Methods CLO Mapping 3,3,4,5,6	
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Field work Group wo Tutorials Reading / Methods Assignme Examinati	k k rk ' Self stu ents ion	udy Details	Weighting in	20 C	to CLO 1,2 CLO 1,2	24 10 8 14 100 ment Methods CLO Mapping 3,3,4,5,6 3,3,4,5,6 2,3,5,6	
Course Teaching & Learning Activities	Activities Lectures Field work Group wo Tutorials Reading / Methods Assignme Examinati Presentat Test R. B. Prima V. D. Free 2008) M.L. Hunte	k V Self str ents ion ack: Es d: Con	udy Details	Weighting in course grad logy (Sinauer, 2006, 4th c resource]: foundation Conservation Biology (E	e (%) 20 C 60 C 10 10 ed.) ss, concepts, a	to CLO 1,2 CLO 1, CLO 1, CLO 1, CLO applicat , 3rd Ec	24 10 8 14 100 ment Methods CLO Mapping 3,4,5,6 2,3,5,6 1,2,3 tions (Springer 3)	

BIOL3313 Freshwater ecol	Academic Year	2015			
Offering Department	Biological Sciences Quota				
Course Co-ordinator	Prof D Dudgeon, Biological Sciences (ddudgeon@hku.hk)				
Teachers Involved	Prof D Dudgeon, Biological Sciences				
Course Objectives	This course introduces freshwater science by integrating the physical and their drainage basins in the context of sustaining human livelihoods management of lakes and maintenance of water quality are consider illustrate the principles of river science and human use of drainage based conservation of freshwater biodiversity in Asia in the context of ecosystems, habitat degradation and water scarcity.	s and biodiversity. Con red also. Case studie: sins. Emphasis will be	servation and s are used to e placed upon		

Course Contents & Topics	The amount of water on Earth is fixed. Less than 0.01% of the world's water is in lakes and relative water hosts 10% of the Earth's species. Global water use has increased 300% since 1950 a faster than the Earth's population; many people in Asia already face water stress. This cour the physicochemical processes involved in the hydrological cycle and flow of water in draina well as their seasonal fluctuations, and describes the main longitudinal changes that occur alcompanies their floodplains. Energy flows in freshwater ecosystems are described with particular refet transfer of materials between water and land and the relative importance of aquatic prima versus energy derived from detrital inputs from the land. The range of organisms associate fresh waters is introduced and their functional roles explained, and students will become famil common Hong Kong species in field trips and laboratory sessions. The dependence of freshwater ecosystems and the role they play in sustaining livelihoods is explained, toge causes and consequences of human modification of fresh waters, and the implications for conquatic biodiversity. Finally the range of management strategies used to reduce or mitigate human freshwater ecosystems and maintain water quality is introduced.					950 and is growing a course introduces drainage basins, as the along rivers and ar reference to the primary production as familiar with some for of humans on together with the for conservation of	
Course Learning Outcomes		•	ems and maintain water qu tion of this course, students	-			
Course Learning Outcomes	CLO 1	describe the	global water cycle, the mair	n sources	s and pathways of ene	rgy in fre	eshwaters, and the
	CLO 2	describe the aquatic ecos	and-water interactions on a composition of the freshy ystems, and identify some	vater bic	ota (major groups) an		
	CLO 3 of	reshwater b	results of modification of fround of the odiversity in Asia, explain the management strategies	why fres	shwater biota are vuln	erable t	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	IOL2102 Bio	statistics and BIOL2306 Ec	ology an	d evolution		
Offer in 2015 - 2016	N				Examir	nation	
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	В	subject as demonstrated by background reading and excellent use of named (organism) examples. Show excellent presentational, analytical skills and/or lab/field skills, and substantial knowledge of general freshwater biodiveristy or selected taxa. Excellent or outstanding (for A+) work relative to what is required at degree level.					
	grasp of the subject as demonstrated by background reading and use of named (organism) examples. Show good presentational, analytical and/or lab/field skills, and knowledge of general freshwater biodiversity or selected taxa. Work more than sufficient for what is required at degree level. C Evidence of some analytical (or critical) abilities and logical (or coherert) thinking with an adequate (but incomplete) grasp of the subject, but little or no evidence of original thinking, with limited background reading and use of named (organism) examples. Show fair presentational, analytical and/or lab/field skills, and some knowledge of general						
	freshwater biodiversity or selected taxa. Work sufficient for what is required for degree level. D Evidence of retention of a minimum of relevant information of the subject (i.e. knowledge is very incomplete), with limited organizational, analytical or presentational skills. Shows insufficient evidence of background reading, or familiarity with lab/field techniques or freshwater biodiversity. Work merely (for D+) or barely (D) adequate for what is required at degree level.						
	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 w	ith laborator	y component course				
Course Teaching	Activitie	s		Details No			No. of Hours
& Learning Activities	Lectures						26
	Laborato	ory		project and laboratory work; field trips to local streams and wetlands			40
	Reading	/ Self study		1			100
Assessment Methods and Weighting	Methods	5	Details		Weighting in final course grade (%)	Asse	essment Methods to CLO Mapping
	Assignm	ents			30		CLO 2
	Examina	tion			60		CLO 1,2,3
	Laborato	ory reports			10		CLO 3
Required/recommended reading and online materials	The Meko An online information river heal	ong River Aw training too on on the phy th.	M.M. (2007). Stream Ecologiareness Kit (RAK) http://www.developed by an international process and biological features will be allable in HKU library will be	vw.mrcm onal tear es of rive	ekong.org/RAK/html/rann(including the coursens, and shows how hu	e coordir man live	nator) that contains elihoods depend on
Course Website			.hk/ecology/lsc/				
Additional Course Information			ered subject to a minimum	enrollmo	nt number and availab	ility of to	achers
Additional Course Illiorniation	THIS COUR	OG WIII DE UII	oroa subject to a minimum (CITIONITIE	in number and availab	inty of te	auticis.

BIOL3314 Plant structure a	and evolu	ition (6 cred	aits)		Academ	ic Year	2015	
Offering Department	Biologica	al Sciences			Quota		30	
Course Co-ordinator	Prof R M	Prof R M K Saunders, Biological Sciences (saunders@hku.hk)						
Teachers Involved	Prof R M	Prof R M K Saunders, Biological Sciences						
Course Objectives	significa	To survey the form and function of the vascular plant body, with particular emphasis on the evolutionar significance of structures. This course forms a basis for understanding plant physiology, ecology systematics and phylogenetics.						
Course Contents & Topics	explanat phyloger developr such as	The course will investigate various cell, tissue and organ types in the vascular plant body, with fuexplanations for their diversity and discussions of the value of such knowledge in understandingly organized. Information on plant structure will be integrated with our current understangle developmental genetics and taxonomic relationships derived from molecular phylogenetic research such as food storage, strength, water conduction, growth and development, pollination, fertilization and seed dispersal, germination, etc., will be discussed.						
Course Learning Outcomes	On succ	essful comple	tion of this course, studer	nts should	be able to:			
	CLO 1		e main plant cell types an as the xylem and phloem		how cells are integrate	d to form	specific primary	
	CLO 2	describe the growth	developmental changes	that occur	in primary tissues wit	h the ons	et of secondary	
	CLO 3	describe the bark)	structure, function and de	evelopmer	nt of secondary vegeta	tive struct	ures (wood and	
	CLO 4	integrate kno diversity	owledge of the genetic of	control of	floral development wit	th the evo	lution of organ	
		are derived for	structure of fruits from a from the flower					
	CLO 6		seeds develop after fertili ermination patterns	zation of t	the ovule, and how diff	erences ir	seed structure	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	BIOL1309 Ev	olutionary diversity and an	ny level 2 E	BIOL course			
Offer in 2015 - 2016	Y 2r	nd sem			Examina	ation	May	
Offer in 2016 - 2017	Υ				,			
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining most or course learning outcomes, with evidence of extensive background reading and use of named example evidence of significant critical abilities and logical thinking. Apply highly effective presentation skills. De effective use of data and results to draw appropriate and insightful conclusions.					d examples. Show	
	B Demonstrate substantial command of knowledge required for attaining most of the course le evidence of some background reading and use of named examples. Show evidence of critit thinking. Apply effective presentation skills. Demonstrate use of data and results to draw appropriate to the conclusions.					ce of critical	abilities and logica	
	learning outcomes, with evidence of limited ba				nand of knowledge and skills required for attaining most of the coursed background reading and use of named examples. Show evidence copply moderately effective presentation skills. Demonstrate mostly correct and insightful conclusions.			
	D	D Demonstrate partial but limited command of knowledge and skills required for attaining some of outcomes, with insufficient evidence of background reading and use of named examples. Show critical abilities and logical thinking. Apply limited presentation skills. Demonstrate limited abilities used to draw appropriate and insightful conclusions.					evidence of limited	
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course outcomes, with no evidence of background reading or use of named examples. Show little or no evidence of abilities and logical thinking. Presentational skills are minimally effective or ineffective. Misuse of data and redraw appropriate conclusions.					evidence of critical		
Course Type	Lecture	with laborator	y component course					
Course Teaching	Activiti	es		Details	.		No. of Hours	
& Learning Activities	Lecture	S					24	
	Laborat	tory					36	
	Reading	g / Self study					100	
Assessment Methods	Methods		Details		Weighting in final course grade (%)		ment Methods CLO Mapping	
	in our oc							
	Examin	ation			70	CLO	1,2,3,4,5,6	
	Examin	ation ory reports					1,2,3,4,5,6 1,2,3,4,5,6	
Assessment Methods and Weighting Required/recommended reading and online materials	Examin Laborat P. Ruda P.H. Rav	ory reports II: Anatomy of ven, R.F. Eve	Flowering Plants, 3rd ed. rt & S.E. Eichhorn: Biology ding material will be provic	y of Plants	70 30 ge Univ. Press (2007) , 7th ed. Freeman (200	CLO		

Additional Course Information | This course will be offered subject to a minimum enrollment number and availability of teachers.

-	tertidal ec				Academic Year	2015		
Offering Department		al Science			Quota	20		
Course Co-ordinator			Biological Sciences (hrsbwga	@hku.hk)				
Teachers Involved			Biological Sciences					
Course Objectives	regulate shores a	To examine the communities of coastal systems: their distribution, composition and the factors whice egulate them. This course will examine, using an experimental approach, patterns exhibited by a range shores and the deterministic and stochastic processes that create and sustain them. Hong Kong shore will be used as examples but comparisons will be drawn from the coastlines of the world.						
Course Contents & Topics	communi waves; g conseque with spec sampling factors (e	ne first part of this course describes shores of the marine to brackish water continuum a summunities found on them. Lectures will cover the physical environment of the intertidal (e.g. aves; geological and hydrological processes) the resultant variations in exposure and shore type onsequent distribution of animals and algae on these shores (vertical and horizontal zonation proteins the specific Hong Kong examples. The second part of the course uses an experimental approar ampling methodology; manipulative techniques; experimental design and data analysis) to investigators (e.g. predation; herbivory; competition; disturbance; succession; patchiness and recruitment; de ecology) that structure these shores, with particular focus on rocky intertidal shores.						
Course Learning Outcomes	On succe	essful cor	npletion of this course, students	should be able to:				
		and how	the physical environmental fact they interact with geographic f nangroves)					
			nd the factors limiting species of methods to measure and inve		the vertical interti	dal gradient and		
	CLO 3	identify a	nd quantify the distribution of a	variety of local species	on different Hong	Kong shores		
			critique and design experimen s (e.g., herbivory, competition)		ate patterns (e.g.	, zonation) and		
		CLO 5 explain the role of biological processes (e.g., predation, succession) and their interaction with the physical environment in shaping intertidal communities						
	CLO 6 plan, design, execute, analyse and present a simple experimental study on intertidal ecology							
Pre-requisites and Co-requisites and mpermissible combinations)	Pass in E	BIOL2102	Biostatistics or BIOL3301 Mari	ne biology				
Offer in 2015 - 2016	Y 2n	nd sem			Examination	May		
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	A Evidence of original, logical (or coherent) thought, strong analytical and critical abilities and a thorough grasp of subject as demonstrated by background reading and excellent use of named (organism) examples. Show excel presentational, analytical skills and/or lab/field skills, and demonstrate substantial knowledge of general intertional ecology and excellent experimental design and analysis skills.						
	_	B Evidence of analytical (or critical) abilities and logical (or coherent), but not necessarily original, thinkir grasp of the subject as demonstrated by background reading and use of named (organism) examples. S presentational, analytical and/or lab/field skills, and demonstrate knowledge of general intertidal ecology experimental design and analysis skills.						
	В	presen	tational, analytical and/or lab/field skill	kground reading and use of	named (organism) ex	amples. Show good		
	С	Eviden grasp (organi	tational, analytical and/or lab/field skill	kground reading and use of s, and demonstrate knowled es and logical (or coherent) e of original thinking, limite al, analytical and/or lab/field	f named (organism) ex dge of general intertida thinking with an adequ d background reading skills, and demonstrat	amples. Show good al ecology and good ate (but incomplete and use of named		
		presen experir Eviden grasp (organi of gene Eviden limited familial	tational, analytical and/or lab/field skill mental design and analysis skills. ce of some analytical (or critical) abiliti of the subject, but little or no evidenc sm) examples. Show fair presentation	kground reading and use of s, and demonstrate knowled es and logical (or coherent) se of original thinking, limite al, analytical and/or lab/field lities of experimental design ant information of the subject ational skills. Show insuffice	f named (organism) ex dge of general intertida thinking with an adequ d background reading skills, and demonstrat and analysis. tt (i.e. knowledge is ve ient evidence of back	amples. Show good all ecology and good ate (but incomplete and use of named es some knowledge ery incomplete), with ground reading, o		
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Course Type	C D Fail	presen experir Eviden grasp (organi of gene Eviden limited familian experir Eviden organizab/fiele skills.	tational, analytical and/or lab/field skill mental design and analysis skills. ce of some analytical (or critical) abiliti of the subject, but little or no evidenc sm) examples. Show fair presentation eral intertidal ecology and adequate abi ce of retention of a minimum of releva organizational, analytical or present rity with lab/field techniques. Poor nental design and analysis. ce of poor or inadequate knowledge tation and/or excessive irrelevancy. Li	kground reading and use of s, and demonstrate knowled es and logical (or coherent) the of original thinking, limite al, analytical and/or lab/field lities of experimental design ant information of the subjectational skills. Show insufficient knowledge of general interpretation of the mited or no evidence of far	f named (organism) ex tge of general intertidate thinking with an adequ d background reading skills, and demonstrate and analysis. It (i.e. knowledge is ve- ient evidence of back- ertidal ecology and no subject, and a lack- miliarity with relevant re-	amples. Show good all ecology and good at ecology and good ate (but incomplete and use of namedes some knowledge ery incomplete), with ground reading, on isunderstanding of coherence, pooleading material and		
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Required/recommended reading and online materials	Morton, B. & Morton, J.: The Seashore Ecology of Hong Kong (Hong Kong University Press, 1983) Little, C. & Williams, G.A. & Trowbridge, C.D.: The Biology of Rocky Shores (Oxford University Press, 2009) TBC
Course Website	http://www.biosch.hku.hk/ecology/lsc/
Additional Course Information	This course will be offered subject to a minimum enrollment number and availability of teachers.

	ogy (6 credi			Academic Year	2015			
Offering Department	Biological	Sciences		Quota	30			
Course Co-ordinator	Dr B Guen	ard, Biological Sciences (bguenar	d@hku.hk)					
Teachers Involved	Dr B Guen	ard, Biological Sciences						
Course Objectives		To enable motivated students to acquire the knowledge and skills needed to solve real problems terrestrial ecology.						
Course Contents & Topics	tropical Ea Students we distribution learn differ flow in ter ecosystem tropical for including a Two probles learning.	This course will focus on the ecology of terrestrial habitats. The emphasis will be on the tropical East Asia, but the course will also include an overview of patterns and processes of Students will first learn about the geological history of the land mass on earth, the biogeogy distribution of major terrestrial ecosystems, especially in Tropical East Asia. Then, stude learn different important processes including herbivory, carnivory, pollination, seed dispe flow in terrestrial ecosystems. The second half of the course will start with the degrecosystems nowadays and the important process of ecological succession. Restoration e tropical forests can be restored will then be introduced. Two other major threats to terrest including alien invasive species and wildfire will also be addressed. Two problem-based learning exercises are included to provide students with an alter learning. The practical component of the course will introduce students to the basic field tech terrestrial ecology. Students will participate to a group project, collect and analyze data, a scientific paper.						
Course Learning Outcomes	On succes	sful completion of this course, stud	dents should be able to:					
		nderstand evolution of biodiversity different geographic and time sca		esses within terrest	rial ecosystems			
	CLO 2 ur	CLO 2 understand the current patterns that sustain biodiversity in their pristine form and disturbed state						
	CLO 3 understand the various threats to terrestrial ecosystems and some of the methods to evaluate and reduce the impacts of those threats							
	CLO 4 plan and conduct baseline study of terrestrial biodiversity							
	CLO 5 develop the skill to be an active learner through the problem-based learning exercises							
Pre-requisites (and Co-requisites and	Pass in BIG	Pass in BIOL3303 Conservation ecology						
impermissible combinations)								
	Y 2nd	sem		Examination	May			
Offer in 2015 - 2016	Y 2nd	sem		Examination	May			
Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade		sem		Examination	May			
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Υ	Demonstrate thorough mastery at an a course learning outcomes. Show strong thought, ability to integrate and synthes familiar and unfamiliar situations. Apply thoughtful and reflective thinking. Demonstrate substantial command of a	analytical and critical abilities an ize information, and ability to app highly effective presentational s broad range of knowledge and ski	wledge and skills requind logical thinking, with a by knowledge to a wide skills. Strong evidence of the strain of the strain of the strain of the skills is required for attaining	red for attaining a evidence of origina e range of complex of clear attention to at least most of the			
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Y A+ to F	Demonstrate thorough mastery at an acourse learning outcomes. Show strong thought, ability to integrate and synthes familiar and unfamiliar situations. Apply thoughtful and reflective thinking.	analytical and critical abilities an ize information, and ability to app in highly effective presentational substantial substantial and site broad range of knowledge and skience of analytical and critical and some un	wledge and skills required to logical thinking, with one of the street o	red for attaining a evidence of origina e range of complex of clear attention to at least most of the king, integration o			
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Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	Y A+ to F A B C D	Demonstrate thorough mastery at an a course learning outcomes. Show strong thought, ability to integrate and synthes familiar and unfamiliar situations. Apply thoughtful and reflective thinking. Demonstrate substantial command of a course learning outcomes. Show evid materials and ability to apply knowl presentational skills. Evidence of clear a Demonstrate general but incomplete c learning outcomes. Show evidence of sknowledge to most familiar situations attention to thoughtful and reflective thin Demonstrate partial but limited comman outcomes. Show evidence of some cof little attempt at integration. Show limited presentational skills. Lack of attention to Demonstrate little or no evidence of coutcomes. Lack of analytical and critical	analytical and critical abilities an ize information, and ability to appy highly effective presentational subroad range of knowledge and skience of analytical and critical addge to familiar and some untention to thoughtful and reflective premand of knowledge and skills some analytical and critical abilities. Apply moderately effective preking. In do f knowledge and skills require erent and logical thinking, but wit is ability to apply knowledge to sol thoughtful and reflective thinking.	wledge and skills required logical thinking, with only knowledge to a wide skills. Strong evidence of the street leads to a wide skills. Strong evidence of the street leads to a wide skills required for attaining shilling and logical thinking. It required for attaining shilling sentational skills. Little and for attaining some of the limited analytical and the problems. Apply limited required for attaining thing. Show very little of the street limited analytical and the problems. Apply limited analytical shilling shilling.	red for attaining a evidence of origina e range of complex of clear attention to at least most of the king, integration of monstrate effective most of the course and ability to apply evidence of clear the course learning critical abilities and ted effectiveness in the course learning or no ability to apply the course learning or no ability to apply the co			
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	Y A+ to F A B C D	Demonstrate thorough mastery at an a course learning outcomes. Show strong thought, ability to integrate and synthes familiar and unfamiliar situations. Apply thoughtful and reflective thinking. Demonstrate substantial command of a course learning outcomes. Show evid materials and ability to apply knowl presentational skills. Evidence of clear a Demonstrate general but incomplete learning outcomes. Show evidence of knowledge to most familiar situations attention to thoughtful and reflective thin Demonstrate partial but limited comman outcomes. Show evidence of some cohittle attempt at integration. Show limite presentational skills. Lack of attention to Demonstrate little or no evidence of coutcomes. Lack of analytical and critica knowledge to solve problems. Organizat	analytical and critical abilities an ize information, and ability to appy highly effective presentational subroad range of knowledge and skience of analytical and critical addge to familiar and some untention to thoughtful and reflective premand of knowledge and skills some analytical and critical abilities. Apply moderately effective preking. In do f knowledge and skills require erent and logical thinking, but wit is ability to apply knowledge to sol thoughtful and reflective thinking.	wledge and skills required logical thinking, with only knowledge to a wide skills. Strong evidence of the street leads to a wide skills. Strong evidence of the street leads to a wide skills required for attaining shilling and logical thinking. It required for attaining shilling sentational skills. Little and for attaining some of the limited analytical and the problems. Apply limited required for attaining thing. Show very little of the street limited analytical and the problems. Apply limited analytical shilling shilling.	red for attaining all evidence of originals range of complex of clear attention to at least most of the king, integration of monstrate effective most of the course and ability to apply evidence of clear the course learning critical abilities and ted effectiveness in the course learning or no ability to apply fective.			
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	Y A+ to F A B C D Fail Lecture with	Demonstrate thorough mastery at an a course learning outcomes. Show strong thought, ability to integrate and synthes familiar and unfamiliar situations. Apply thoughtful and reflective thinking. Demonstrate substantial command of a course learning outcomes. Show evid materials and ability to apply knowl presentational skills. Evidence of clear a Demonstrate general but incomplete learning outcomes. Show evidence of knowledge to most familiar situations attention to thoughtful and reflective thin Demonstrate partial but limited comman outcomes. Show evidence of some cohittle attempt at integration. Show limite presentational skills. Lack of attention to Demonstrate little or no evidence of coutcomes. Lack of analytical and critica knowledge to solve problems. Organizat	a analytical and critical abilities an ize information, and ability to appy highly effective presentational subroad range of knowledge and skience of analytical and critical aedge to familiar and some un ttention to thoughtful and reflective formand of knowledge and skills some analytical and critical abilitie. Apply moderately effective preking. Individual of knowledge and skills require erent and logical thinking, but with a ability to apply knowledge to sol thoughtful and reflective thinking. In a silities, logical and coherent thin and presentational skills are medical to apply knowledge and skills abilities, logical and coherent thin and presentational skills are medical to apply knowledge.	wledge and skills required logical thinking, with only knowledge to a wide skills. Strong evidence of the street leads to a wide skills. Strong evidence of the street leads to a wide skills required for attaining shilling and logical thinking. It required for attaining shilling sentational skills. Little and for attaining some of the limited analytical and the problems. Apply limited required for attaining thing. Show very little of the street limited analytical and the problems. Apply limited analytical shilling shilling.	red for attaining a evidence of origina e range of complex of clear attention to at least most of the king, integration of monstrate effective most of the course and ability to apply evidence of clear the course learning critical abilities and ted effectiveness in the course learning or no ability to apply fective.			
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	Y A+ to F A B C D Fail Lecture with	Demonstrate thorough mastery at an a course learning outcomes. Show strong thought, ability to integrate and synthese familiar and unfamiliar situations. Apply thoughtful and reflective thinking. Demonstrate substantial command of a course learning outcomes. Show evide materials and ability to apply knowl presentational skills. Evidence of clear a Demonstrate general but incomplete clearning outcomes. Show evidence of sknowledge to most familiar situations attention to thoughtful and reflective thin Demonstrate partial but limited comman outcomes. Show evidence of some colitite attempt at integration. Show limiter presentational skills. Lack of attention to Demonstrate little or no evidence of coutcomes. Lack of analytical and critica knowledge to solve problems. Organizational skills laboratory component course	a analytical and critical abilities an ize information, and ability to appy highly effective presentational subroad range of knowledge and skience of analytical and critical aedge to familiar and some un ttention to thoughtful and reflective formand of knowledge and skills some analytical and critical abilitie. Apply moderately effective preking. Individual of knowledge and skills require erent and logical thinking, but with a ability to apply knowledge to sol thoughtful and reflective thinking. In a silities, logical and coherent thin and presentational skills are medical to apply knowledge and skills abilities, logical and coherent thin and presentational skills are medical to apply knowledge.	wledge and skills required logical thinking, with a bly knowledge to a wide skills. Strong evidence of the skills strong evidence of the skills required for attaining bilities and logical thin familiar situations. Dere thinking. It required for attaining as and logical thinking, sentational skills. Little and for attaining sentational skills. Little and for attaining some of the skills of the skills and the problems. Apply limited analytical and the problems. Apply limited in the skills of the skills	red for attaining all evidence of original erange of complex of clear attention to at least most of the king, integration of monstrate effective most of the course and ability to apply evidence of clear the course learning critical abilities and ted effectiveness in the course learning or no ability to apply or no ability to apply the course learning or no ability to			
Offer in 2015 - 2016 Offer in 2016 - 2017	Y A+ to F A B C D Fail Lecture with Activities Lectures	Demonstrate thorough mastery at an a course learning outcomes. Show strong thought, ability to integrate and synthese familiar and unfamiliar situations. Apply thoughtful and reflective thinking. Demonstrate substantial command of a course learning outcomes. Show evide materials and ability to apply knowl presentational skills. Evidence of clear a Demonstrate general but incomplete clearning outcomes. Show evidence of sknowledge to most familiar situations attention to thoughtful and reflective thin Demonstrate partial but limited comman outcomes. Show evidence of some colitite attempt at integration. Show limiter presentational skills. Lack of attention to Demonstrate little or no evidence of coutcomes. Lack of analytical and critica knowledge to solve problems. Organizational skills laboratory component course	analytical and critical abilities an ize information, and ability to appy / highly effective presentational s broad range of knowledge and skience of analytical and critical aedge to familiar and some un ttention to thoughtful and reflective premains of knowledge and skills some analytical and critical abilities. Apply moderately effective preking. In add of knowledge and skills require erent and logical thinking, but with a ability to apply knowledge to sol thoughtful and reflective thinking. In a premain of knowledge and skills abilities, logical and coherent this in and presentational skills are mediate.	wledge and skills required logical thinking, with a bly knowledge to a wide skills. Strong evidence of the skills strong evidence of the skills required for attaining bilities and logical thin familiar situations. Dere thinking. It required for attaining as and logical thinking, sentational skills. Little and for attaining sentational skills. Little and for attaining some of the skills of the skills and the problems. Apply limited analytical and the problems. Apply limited in the skills of the skills	red for attaining al evidence of origina range of complex of clear attention to at least most of the king, integration of monstrate effective most of the course and ability to apply evidence of clear the course learning critical abilities and ted effectiveness in the course learning or no ability to apply fective. No. of Hours			

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		40	CLO 1,2,3,4,5
	Presentation		25	CLO 1,2,3,4,5
	Project report		25	CLO 1,2,3,4,5
Required/recommended reading and online materials		Corlett R. T.: Ecology an	t Asia (Oxford University Press, 200 nd Biodiversity of Hong Kong (Friend	
Course Website	http://www.biosch.	hku.hk/ecology/lsc/		
Additional Course Information	This course will be	e offered subject to a mi	nimum enrollment number and availa	ability of teachers.

BIOL3320 The biology of n	narine ma	ammals (6 credits)	Academic Year	2015				
Offering Department	Biologic	Biological Sciences Quota 30						
Course Co-ordinator	Dr L Kar	Dr L Karczmarski, Biological Sciences (leszek@hku.hk)						
Teachers Involved	Dr L Kar	Dr L Karczmarski, Biological Sciences						
Course Objectives	whales conserve (pinnipe ecology	Few other groups of animals have captured the public's imagination the way marine mammals, espenhales and dolphins have. This course covers the evolutionary biology, ecology, behaviour conservation of marine mammals: whales, dolphins and porpoises (cetaceans), seals and wa (pinnipeds), manatees and dugongs (sirenians) and sea otters. Students will learn to understare ecology of mammalian life in the aquatic environment, their role in the marine ecosystem, their behavior complexity and socio-ecology, and the current threats to these animals in the human-dominated world						
Course Contents & Topics	The course begins with an overview of marine mammal species and their global distribution, review of the various adaptations that have evolved to meet the challenges of the marine Next, the course discusses the life history, reproductive strategies, ecology and population marine mammals, highlighting the similarities and differences between species in this diverse group of animals. This is followed by sessions on behaviour and behavioural ecologiscuss animal movement, diving and ranging behaviour, foraging strategies, ecology of gro social behaviour, behavioural complexity, cognition, and social strategies that guide the daily animals. The course concludes with a discussion of human influences on the fate of marine examples of critically endangered species and populations, and a review of conservation and strategies; our emphasis is on the importance of applying the knowledge of population ecologiand behavioural ecology in ensuring long-term effective conservation of marine mammal popic course is designed for 3rd and 4th year students; it includes field trips, discussions of cur research, innovative research techniques and recent discoveries. Students will undertake literature-searches and will discuss their projects during classroom debates, training the conceptual and analytical approaches to science.							
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1	CLO 1 appreciate marine mammal diversity and biogeography						
	CLO 2 understand how mammals adapt and function in an aquatic environment and their role in the marine ecosystem							
	CLO 3 understand and appreciate the complexity of interactions between environmental selective pressures and marine mammal behaviour, population structure and demography							
	CLO 4 appreciate the socio-ecological diversity and behavioural complexity of marine mammals							
	CLO 5 think analytically in terms of marine mammal ecology and anthropogenic impacts in the rapidly changing world							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	BIOL2306 Ecology and evolution						
Offer in 2015 - 2016	Y 1:	st sem	Examination	Dec				
Offer in 2016 - 2017	N		'					
Course Grade	A+ to F							
Grade Descriptors	A	Evidence of a thorough grasp of the subject in a broader comparative reading and excellent use of named examples and case studies. excellent use of a broad range of fundamental concepts to draw insignation to learn, great abilities of independent work, effective presentation excellent or outstanding work relative to what is required at degree leverage.	Evidence of independent of ghtful and logical conclusion skills with excellent analytems.	critical thought wi s. Show eagernes				
	В	Evidence of a good grasp of the subject as demonstrated by som named examples and some case studies. Evidence of good critical t and very good (but not outstanding) abilities of independent work, e and logical argumentation. Good general command of acquired conclusions. Work more than sufficient for what is required at degree	hought, although not necess effective presentation skills v knowledge to draw mea	sarily original. Goo				
	С	Demonstrate an adequate, but not coherent and incomplete grasp and limited use of named examples and case studies. Some abilitiand/or independent; only partial abilities to use acquired knowledg conclusions. Fair presentation skills, with mostly correct argument broader concepts. Work sufficient for what is required for degree level	ies of logical critical thinking e and work independently tation, but limited (or no) a	g, but not insightf to draw meaningf				
	D	Demonstrate some grasp of the subject, but partial and limited to the none) case studies. Insufficient evidence of background reading, limit						

		articularly effective presentation skills wippriate conclusions. Work barely meets w			tion and re	estricted ability of drawing	
	no fa	vidence of basic minimum knowledge ar amiliarity with any relevant examples active presentation skills with poor argur n degree level.	and ca	ase studies. Inadequate evid	lence of o	coherent logical thought;	
Course Type	Lecture with labor	oratory component course					
Course Teaching	Activities		Det	tails		No. of Hours	
& Learning Activities	Lectures					24	
	Laboratory		including field trips, research site vists, demonstration of research techniques, interactive classroom debates		search	32	
	Project work		project work review			8	
	Reading / Self s	tudy				60	
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	As	sessment Methods to CLO Mapping	
	Assignments	including active participation/continuous assessment/presentation		55	С	CLO 1,2,3,4,5	
	Examination			45 C		LO 1,2,3,4,5	
Required/recommended reading and online materials	Reynolds JE & R Perrin WF, Wurs	Hoelzel AR (ed). Marine mammal biology: An evolutionary approach (Blackwell Science 2002) Reynolds JE & Rommel SA (eds). Biology of marine mammals (Smithsonian Institution Press 1999) Perrin WF, Wursig B & Thewissen JGM (eds). Encyclopedia of marine mammals (Academic Press 2008) Mann J, Connor RC, Tyack PL & Whitehead H (eds). Cetacean societies (The University of Chicago Pres					
Course Website	http://www.biosc	h.hku.hk/ecology/lsc/					
Additional Course Information		fered in alternate year. be offered subject to a minimum	enrol	Ilment number and availa	ability of	teachers.	

BIOL3401 Molecular biolog	y (6 cred	dits)	Academic Year	2015					
Offering Department	Biologic	Biological Sciences Quota 130							
Course Co-ordinator	Prof B K	Prof B K C Chow, Biological Sciences (bkcc@hku.hk)							
Teachers Involved		Prof B K C Chow, Biological Sciences Dr K W Y Yuen, Biological Sciences							
Course Objectives		To provide students with recent knowledge in molecular biology with special emphasis on the study of genestructure and function at the molecular level.							
Course Contents & Topics	DNA re emphas biochem and DNA	The course includes a detailed account of the molecular processes in eukaryotic and prokaryotic cells, from DNA replication, RNA transcription, protein translation, to post-translational modifications with special imphasis on the regulation of prokaryotic and eukaryotic gene expression. Recently develope in inchemical techniques including oligonucleotide synthesis, DNA sequencing, complementary screening DNA cloning, site-directed mutagenesis, polymerase chain reaction and transgenic technology will also be discussed.							
Course Learning Outcomes	On succ	essful completion of this course, students should be able to:							
	CLO 1	CLO 1 know the basic structures of DNA, RNA and protein, and how DNA is package in the nucleus of eukaryotic cells							
	CLO 2 understand the biochemical processes involved in DNA replication, transcription, translation and post-translational modifications in prokaryotes and eukaryotes								
	CLO 3 explain and describe the regulation of gene transcription in prokaryotes and eukaryotes								
	CLO 4	demonstrate knowledge and understanding of the underly developed techniques including PCR, site-directed mutager							
Pre-requisites (and Co-requisites and Impermissible combinations)		BIOL2103 Biological sciences laboratory course or BIO Basic biochemistry or MEDE2301 Life science I	DL2220 Principles of	biochemistry or					
Offer in 2015 - 2016	Y 1	st sem	Examination	Dec					
Offer in 2016 - 2017	Υ		'	'					
Course Grade	A+ to F								
Grade Descriptors	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.								
	В	Demonstrate substantial command of a broad range of knowledge re learning outcomes. Show evidence of analytical and critical abilit knowledge to familiar and some unfamiliar situations. Apply effective results to draw appropriate conclusions. Apply effective organizationa	ies and logical thinking, a ab skills and techniques. C	and ability to apply					

	outo to m	nonstrate general but incomplete commones. Show evidence of some analytical toost familiar situations. Apply moderately of data and results to draw appropriate cost.	and critical abilities and logical think effective lab skills and techniques.	king, and ability to apply knowledge Mostly correct but some erroneous				
	Sho abili data	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.						
	Lack to so	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 with lab	oratory component course						
Course Teaching & Learning Activities	Activities		Details	No. of Hours				
	Lectures			24				
	Laboratory			20				
	Tutorials			6				
	Reading / Self	study		100				
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping				
	Assignments	assessment of practical work	20	CLO 1,2,4				
	Examination		80	CLO 1,2,3,4				
Required/recommended reading and online materials	J. Watson et al.: B. Lewin: Gene	lecular Biology (McGraw-Hill, 200 Molecular Biology of the Gene (I IX (Jones and Bertlett, 2008) I articles and web learning materi	Benjamin Cummings, 2004)					
Course Website	http://moodle.hk	:u.hk/						

BIOL3402 Cell biology and	cell techn	ology (6 credits)	Academic Year	2015			
Offering Department	Biological	Sciences	Quota	120			
Course Co-ordinator	Prof A S T	「Wong, Biological Sciences (awong1 @hku.hk)					
Teachers Involved	Prof M L 0	Prof A S T Wong, Biological Sciences Prof M L Chye, Biological Sciences Dr W Y Lui, Biological Sciences					
Course Objectives		le a coherent understanding of the structure and fun- ns of cell culture and instrumentation in biology and biotec		e principles and			
Course Contents & Topics	transport. Cell-matrix	nbranes. Organelles. Cellular transport: ions transport Membrane potentials, Action potentials. Cell junctions. Ex x interactions.					
	II. Techniques in animal cell culture Mammalian cells in culture. Primary and continuous cell lines. Cell types and cell growth parameters. Media formulation, growth factors and design of serum-free media. Culture lab facilities and sterilization. Mechanism of cryopreservation.						
	III. Techniques in plant cell culture Root and shoot cultures. Explant regeneration. Protoplasts. Secondary metabolites.						
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	CLO 3 gain insight into real-life applications in cell biology and cell technology					
Pre-requisites (and Co-requisites and Impermissible combinations)		BIOL2103 Biological sciences laboratory course or BI 3 Basic biochemistry or MEDE2301 Life science I	OL2220 Principles o	biochemistry o			
Offer in 2015 - 2016	Y 1st	sem	Examination	Dec			
Offer in 2016 - 2017	Υ		'				
Course Grade	A+ to F						
Grade Descriptors	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, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational skills. Writings consistently demonstrate informed, thoughtful intellectual engagement with broad range of relevant concepts.					
	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						

		wledge to familiar and some unfamilionstrate informed, thoughtful intellectual		
	outc to n	nonstrate general but incomplete commomes. Show evidence of some analytica nost familiar situations. Apply moderat lectual engagement with concepts or the	l and critical abilities and logical thinlely effective organizational skills.	king, and ability to apply knowledge Writings mostly indicate informed,
	Sho ^o abili	nonstrate partial but limited command of we vidence of some coherent and logicaty to apply knowledge to solve problems e intellectual engagement with concepts.	al thinking, but with limited analytica . Apply limited or barely effective or	I and critical abilities. Show limited ganizational skills. Writings indicate
	Lack to s	nonstrate little or no evidence of comma k of analytical and critical abilities, logical solve problems. Organizational skills and lectual engagement with concepts or the	and coherent thinking. Show very lifter minimally effective or ineffective	ttle or no ability to apply knowledge e. Writings reveal an absence of
Course Type	Lecture with lab	oratory component course		
Course Teaching & Learning Activities	Activities		Details	No. of Hours
	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
	Assignments	assessment of practical work	30	CLO 1,2,3
	Examination		70	CLO 1,3
Required/recommended reading and online materials	Mather, J. P.: In	: Molecular Biology of the Cell (G troduction to Cell and Tissue Cul Edwards, G.S.: Plant Cell Culture	ture, Theory and Techniques	
Course Website	http://moodle.hk	:u.hk/		

BIOL3403 Immunology (6 o	credits)			Academic Year	2015		
Offering Department	Biologic	l Sciences		Quota	100		
Course Co-ordinator	Prof W \	Prof W W M Lee, Biological Sciences (hrszlwm@hku.hk)					
Teachers Involved		Lim, Biological Sciences / M Lee, Biological Sciences					
Course Objectives		le a broad understanding of the animal immuno of immunological methods to research and disc	, ,		the application o		
Course Contents & Topics	biologica and of pathway autoimm	Immunological functions in the vertebrates and analogous activities in invertebrates. Structures and biological properties of immunoglobulins and T-cell receptors. Divergence of antibody genes. Emergence and characteristic of lymphoid tissues. Major histocompatibility complex. Complement pathways. Immunity against bacteria, viruses and parasites. AIDS, Vaccination, hypersensitivity, and autoimmunity. Immunological tests and immunochemical techniques using non mammalian and mammalian antibodies and their application to various biological problems.					
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	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 BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or BIOL2103 Biologic sciences laboratory course or MEDE2301 Life science I					
Offer in 2015 - 2016	Y 21	d sem		Examination	May		
Offer in 2016 - 2017	Y						
Course Grade	A+ to F	A+ to F					
Grade Descriptors	A	Exceptionally good performance demonstrating or insight and analysis into the scientific literatures. 3. Su					
	В	Good performance demonstrating full understanding the scientific literatures. 3. Good writing, presentation.	ng of the subject n and group commur	natter. 2. Coherent insiquication skills.	ght and analysis into		
	С						

		Satisfactory performance dementific literatures. 3. Adequate			matter. 2. Some insight into the	
		Limited performance demons entific literatures. 3.Limited wri			er. 2. Some ability to use the	
		1. Poor understanding of subject matter. 2. Little to no insight into use of the scientific literatures. 3. Unable t communicate.				
Course Type	Lecture with lal	boratory component cou	rse			
Course Teaching & Learning Activities	Activities		Detail	s	No. of Hours	
a Learning Activities	Lectures				30	
	Laboratory		during	reading week	16	
	Tutorials				6	
	Reading / Self	fstudy			100	
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examination			80	CLO 1,2,3,4,5	
	Laboratory rep	oorts		20	CLO 1,2,3,4,5	
Required/recommended reading and online materials	Benjamin & Le	J. 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 editior I. Roitt, J. Brostoff and D. Male: Immunology (Mosby, latest 2 editions)				
Course Website	http://moodle.h	http://moodle.hku.hk/				
Additional Course Information	This course wil	Il be offered subject to a	minimum enrollm	ent number and availabil	ity of teachers.	

BIOL3404 Protein structure	and func	tion (6 credits)	Academic Year	2015			
Offering Department	Biological	Sciences	Quota	160			
Course Co-ordinator	Dr W K Yi	p, Biological Sciences (wkyip@hku.hk)					
Teachers Involved	Prof W W	p, Biological Sciences M Lee, Biological Sciences an, Biomedical Sciences					
Course Objectives	the metho	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 and biotechnology.					
Course Contents & Topics	quaternar The relati catalysis a Methods f Enzymolo molecular Protein p combinati purity, opt	Elements of macromolecular structure: sequencing, prediction and determination of secondary, tertiary and quaternary structures; The relationship of protein structure and function: molecular motifs,binding and recognition, enzyme catalysis and specificity; Methods for protein structure determination: X-ray crystallography and nuclear magnetic resonance; Enzymology: enzyme nomenclature, enzyme assay, kinetics and energetics of binding, transition state and molecular mechanisms of catalysis; 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 methods and devices for protein delivery.					
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1 fundamental understanding of principles of protein structure						
	CLO 2 demonstrate a basic understanding of the relationship between protein structure and function						
	CLO 3 design assaying methods for enzymes						
	CLO 4 find out kinetic parameters of proteins or enzymes by graphically techniques						
	CLO 5 learn about the ways to purify protein and the many industrial uses of proteins						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Bl	Pass in BIOC2600 Basic biochemistry or BIOL2220 Principles of biochemistry or MEDE2301 Life science					
Offer in 2015 - 2016	Y 2nd	sem	Examination	May			
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	A 1. Exceptionally good performance demonstrating comprehensive understanding of the subject matter. 2. Critical insight into the scientific literature. 3. Superior writing and group communication skills.					
	B 1. Good performance demonstrating full understanding of the subject matter. 2. Coherent insight into the scientific literature. 3. Good writing and group collaboration skills.						
	С	Satisfactory performance demonstrating adequate understar scientific literature. 3. Adequate writing and group collaboration s		Some insight into the			
	D	Limited performance demonstrating some understanding of scientific literature. 3. Limited writing and group collaboration skill.		me ability to use the			
	Fail	Poor understanding of subject matter. 2. Little to no insight in collaborate.					

Course Type	Lecture-based course				
Course Teaching & Learning Activities	Activities		Details	No. of Hours	
a 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 1,2,3,4,5	
	Examination		70	CLO 1,2,3,4,5	
Required/recommended reading and online materials	None prescribed To be announced	i.			
Additional Course Information	This course will be	This course will be offered subject to a minimum enrollment number and availability of teachers.			

BIOL3405 Molecular micro	biology (6	credits)	Academic Year	2015			
Offering Department	Biologica	l Sciences	Quota	30			
Course Co-ordinator	Dr J S H	Tsang, Biological Sciences (jshtsang@h	ku.hk)				
Teachers Involved	Dr J S H	Tsang, Biological Sciences					
Course Objectives	the mode	This course is intended for biology, biotechnology and biochemistry students who would like to understar he modern fundamentals of microbiology. At the end of the course the students are expected to know the ohysiological, biochemical and molecular aspects of microbiology.					
Course Contents & Topics	microbes means o bacteria a their ass	The basic biochemistry of microorganisms will be described. The intrinsic factors that affect the growth microbes in the environment will be examined. The adaptation of the microbes to the environment because of physiological changes and genetical alterations will be illustrated. The molecular biology bacteria and viruses will be considered. The molecular biology of plasmids and transposable elements are their association with medical aspect will be discussed. The use of modern technology in studying microorganisms will be explored.					
Course Learning Outcomes	On succe	essful completion of this course, students	should be able to:				
	CLO 1	understand the intrinsic reorganization o	f microbes in response to the changing	environments			
	CLO 2	comprehend the major modes of regulat	ion in the microbe				
	CLO 3	CLO 3 explain the biology of bacteriophages and plasmids					
	CLO 4	CLO 4 realize the importance of transposable elements in the survival of the microbes					
	CLO 5	CLO 5 appreciate the development of modern techniques in studying microorganisms					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in B	Pass in BIOL2103 Biological sciences laboratory course					
Offer in 2015 - 2016	Y 2n	d sem	Examination	May			
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining course learning outcomes. Demonstrate thorough grasp of the subject. Show strong analytical and critical a and logical thinking, with evidence of original thought. Apply highly effective lab skills and techniques. Critical data and results to draw appropriate and insightful conclusions. Apply highly effective organizations presentational skills.					
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least mos course learning outcomes. Demonstrate substantial grasp of the subject. Show evidence of analytical and abilities and logical thinking. Apply effective lab skills and techniques. Correct use of data of results t appropriate conclusions. Apply effective organizational and presentational skills.					
	С	C Demonstrate general but incomplete command of knowledge and skills required for attaining relearning outcomes. Demonstrate general but incomplete grasp of the subject. Evidence of some are abilities and logical thinking. Apply moderately effective lab skills and techniques. Mostly correct be use of data and results to draw appropriate conclusions. Apply moderately effective organizational skills.					
	D						
	Fail						
Course Type	Lecture v	vith laboratory component course					
Course Teaching	Activitie	es	Details	No. of Hour			
& Learning Activities	Lectures						

	Laboratory			20		
	Tutorials			6		
	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		
	Laboratory reports		20	CLO 3,4,5		
	Presentation		10	CLO 1,2,5		
Required/recommended reading and online materials	Willey, Sherwood & Watson, Baker, Bell,	TBC Maloy S.R., Cronan J.E. & Freifelder D. Microbial Genetics (Jones & Bartlett 1994, 2nd ed.) Willey, Sherwood & Woolverton: Prescott's Principles of Microbiology (McGraw Hill 2009) Watson, Baker, Bell, Gann, Levine & Losick: Molecular Biology of the Gene (CSHL Press 2008, 6th ed.) Madigan, Martinko, Dunlap & Clark: Brock Biology of Microorganisms (Pearson 2009, 12th ed.)				
Course Website	http://moodle.hku.hk/					
Additional Course Information	This course will be offered subject to a minimum enrollment number and availability of teachers.					

BIOL3406 Reproduction ar	nd reprod	luctive biotechnology (6 credits)	Academic Year	2015				
Offering Department	Biologica	al Sciences	Quota	40				
Course Co-ordinator	Prof A O	L Wong, Biological Sciences (olwong@hku.hk)						
Teachers Involved	Prof A O	Prof A O L Wong, Biological Sciences						
Course Objectives		de a comprehensive overview on modern concepts and retive biotechnology in human and animal models.	recent advance in repro	ductive biology				
Course Contents & Topics	behavior - Molecu systems - Neuroe steroid fe - Enviror reproduc - Embry medicine	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. - Environmental endocrine disruptors and recent advances in biotechnology for fertility control & assistereproduction in human. - Embryonic stem cells & induced pluripotent stem cells and their applications in regenerative medicine/therapeutic cloning. - Germ line engineering & gene therapy, animal cloning and primordial germ cell transplantation in animal						
Course Learning Outcomes		essful completion of this course, students should be able the have a broad understanding of reproductive biology reconstructions.		of sex, differer				
	reproductive strategies & sexual behaviors in animals to the regulatory mechanisms for sex determination & development of reproductive systems							
	CLO 2 have an appreciation of the neuroendocrine control of reproductive functions & reproductive cycle, sexual behavior, parental care, and pregnancy & giving birth to baby in human & mammalian models							
	CLO 3 have a basic understanding on the concept of environmental endocrine disruptors for reproductive functions and the causes of human infertility & assisted reproduction							
	CLO 4 comprehend a wide range of modern technologies for germ line engineering, animal cloning & primordial germ cell transplantation and the applications of embryonic stem cells/induced pluripotent stem cells in regenerative medicine/therapeutic cloning							
Pre-requisites (and Co-requisites and Impermissible combinations)		BIOL2103 Biological sciences laboratory course or E 02 Biostatistics or BIOL2306 Ecology and evolution	BIOL2220 Principles of	biochemistry				
Offer in 2015 - 2016	Y 1s	st sem	Examination	Dec				
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the cours learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original though 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 or results to draw appropriate conclusions. Apply effective organizational and presentational skills.							
	С							
	D	Demonstrate partial but limited command of knowledge required for Show evidence of some coherent and logical thinking, but with lin ability to apply knowledge to solve problems. Apply partially effecti	mited analytical and critical a	bilities. Show limite				

	data a skills.	nd results to draw appropriate conclus	y limited or barely effective of	rganizational and presentational		
	Fail Demonstrate little or no evidence of command of knowledge required for attaining the course learning outcor. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply know to solve problems. Apply minimally effective or ineffective lab skills and techniques. Misuse of data and results a unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffect.					
Course Type	Lecture with labor	Lecture with laboratory component course				
Course Teaching & Learning Activities	Activities		Details	S	No. of Hours	
a Learning Activities	Lectures				24	
	Laboratory				24	
	Tutorials				6	
	Reading / Self st	udy			100	
Assessment Methods and Weighting	Methods	Details	Details		Assessment Methods to CLO Mapping	
	Examination				CLO 1,2,3,4	
	Laboratory repor	ts			CLO 2,3,4	
	Test	Test & Continuous Asses	Test & Continuous Assessment		CLO 1,2,3,4	
Required/recommended reading and online materials	2. 'Yen and Jan Elsevier/Saunders 3. 'Stem Cells in Cambridge Unive 4. 'Essential Reproson 5. 'Pregnancy aft University Press (6. 'Assisted Re Coomarasamy, Work, 'Reproductive as 'The Reproductive a	1. 'Reproduction System at a Glance' by L.J. Heffner & D.J. Schust, Wiley-Blackwell (2014). 2. 'Yen and Jaffe's Reproductive Endocrinology' (e-Book) by J.F. Strauss III & R. Barbiel Elsevier/Saunders (2014) 3. 'Stem Cells in Reproductive Medicine: Basic Science & Therapeutic Potential' by C. Simon et a Cambridge University Press (2013) 4. 'Essential Reproduction' by M.H. Johnson, Wiley-Blackwell (2013) 5. 'Pregnancy after Assisted Reproductive Technology' by E.R.M. Jauniaux & B.R.M.B. Rizk, Cambridg University Press (2012) 6. 'Assisted Reproduction Techniques: Challenges & Management Option' by K. Sharif & A Coomarasamy, Wiley-Blackwell (2012) 7. 'Reproductive and Developmental Toxicology' by R.C. Gupta, Academic Press (2011) 8. 'The Reproductive system' by Randolph W. Krohmer, New York, Chelsea House (2010). 9. 'Reproductive Endocrinology and Infertility' (e-Book) by D. T. Carrell & C. M. Peterson, New Yor				
Course Website	,	http://moodle.hku.hk/				
Additional Course Information		site of School of Biological Scie		ent number and availabi	ility of teachers.	

BIOL3408 Genetics (6 cred	dits)		Academic Year	2015			
Offering Department	Biologica	al Sciences	Quota	50			
Course Co-ordinator	Dr C S C	r C S C Lo, Biological Sciences (clivelo@hku.hk)					
Teachers Involved		Lo, Biological Science ng, Biological Sciences					
Course Objectives	This cou	rse aims to provide students with fundamental knowle	edge of classical, molecula	ır and populatio			
Course Contents & Topics	analysis and rec	Topics will include cellular reproduction, principles and chromosomal basis of Mendelian genetics, linkaginalysis and mapping, concept and definition of the gene, molecular mechanisms of mutation, DNA repaired recombination, DNA transposition, extranuclear inheritance, developmental genetics, quantitative anappulation genetics. Students are strongly encouraged to take BIOL2303 Molecular Biology to get a more comprehensive coverage of topics in molecular genetics.					
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1 appreciate the beauty of genetic organizations in nature						
	CLO 2 use different genetic principles to explain hereditary traits observed in nature and laboratories						
	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	Pass in BIOL2103 Biological sciences laboratory course					
Offer in 2015 - 2016	Y 19	t sem	Examination	Dec			
Offer in 2016 - 2017	Υ		'				
Course Grade	A+ to F						
Grade Descriptors	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						

	lear	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 lea outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. S limited ability to apply knowledge to solve problems. Limited integration of theories, principles, evidence and technic					
	outo	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 lab	oratory component course				
Course Teaching	Activities		Details	No. of Hours		
& Learning Activities	Lectures			24		
	Laboratory			24		
	Tutorials		tutorials & laboratories			
	Reading / Self	study		100		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments	laboratory reports, assignment	s 30	CLO 1,2,3		
	Examination		70	CLO 1,2,3		
Course Website	http://moodle.hl	ku.hk/				
Additional Course Information	This course will	be offered subject to a minimum en	nrollment number and availab	ility of teachers.		

BIOL3409 Business aspect	ts of biot	chnology (6 credits)		Academic Year	2015			
Offering Department	Biologic	Sciences		Quota	40			
Course Co-ordinator	Dr W B	Lim, Biological Sciences (bllim@hku.hk	:)					
Teachers Involved		Lim, Biological Science agiotou, Biological Science						
Course Objectives		The course will give an overview of the innovative developments in biotech industry and provide students with useful tools in learning how an exciting research idea can be turned into a viable busine model.						
Course Contents & Topics	compan enzyme: principle process up, clinic will be i industry	se will first introduce the history and cubes in healthcare biotechnology, protopy, transgenic animals and crops, will be a compared to the control of the control of the control of the control of the course, guestated. Throughout the course, guestated companies.	tein pharmaceuticals taken as examples to try, intellectual prope e covered. Research good laboratory pract st entrepreneurs, mai	s, vaccines, diagrobillustrate the underties, patent laws, and development of tice and good manuagers and directors.	nostics, industrictioning technological patent application of products, scalufacturing practions of the biotechical products.			
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1	understand and demonstrate knowledge of the development and management of biotechnolog businesses						
	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 a	and bioprocessing i	industries			
	CLO 5	participate and contribute to the busines	s side of scientific ent	erprises				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	ny level 2 BIOL or BIOC course						
Offer in 2015 - 2016	Y 21	d sem		Examination	No Exam			
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	Students acquire exceptional skills and know business and technological developments of v	ledge from the course and various biotechnology ventu	d are capable of indepeures.	ndently analyzing th			
	B Students demonstrate a broad and in-depth understanding of the current developments in biotechnology industry and are capable of analyzing the business and technological developments of various biotechnology ventures under guidance.							
	С	Students demonstrate a broad and in-depth un	nderstanding of the current	developments in biotec	hnology industry.			
	D	Students demonstrate a moderate understand	ling of the current developr	ments in biotechnology i	ndustry.			
	Fail	Students fail to demonstrate a moderate unde	rstanding of the current de	velopments in biotechno	ology industry.			
Course Type	Lecture-	ased course						

Course Teaching	Activities			ails	No. of Hours
& Learning Activities	Lectures				36
	Group work		grou	up work/project/visit	12
	Reading / Self s	study			100
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments	patent (10%), licensing agreement (10%), business plan (35%)		CLO 1,2,3,4,5	
	Presentation	learn yourself (5%), team build (10%)	ding	15	CLO 1,2,3,4,5
	Test			15	CLO 1,2,3,4,5
Required/recommended reading and online materials	TBC				
Course Website	http://moodle.hk	u.hk/			
Additional Course Information	This course will I	be offered subject to a minimum of	enrollr	ment number and availab	oility of teachers.

BIOL3419 Insect ecology: t	he little th	nings that run the world (6 credits)	Academic Year	2015
Offering Department	Biological	Sciences	Quota	25
Course Co-ordinator	Dr B Gue	nard, Biological Sciences (bguenard@hku.hk)	·	
Teachers Involved	Dr B Gue	nard, Biological Sciences		
Course Objectives	and arach	se introduces the students with the biology of terrestrial nnids, students will be introduced to various aspects of the ogy to understand the fundamental roles that arthropms. The course will focus particularly on the diversity	neir anatomy and physiolo oods play in natural and	ogy, systematic I human-shape
Course Contents & Topics	80% of a evolutional herbivore arthropod is often un arthropod morpholo paradigm. This courthey dese course wi focus on course wi	at 1.1 million and 110,000 species described respective all species known on the planet. A diversity also reary adaptations or ecological interactions played at a species, pollinators, seed-dispersal agents, predators, parasts are major components in the stability and functioning inderestimated by many fields of biology to the profit of less offer incredible opportunities for scientific discover gy, reproduction or behaviour beyond the most prolification in the second evolution. See will propose an introduction to these extremely succeive. A first step to the study of arthropods is to learn half present the main criteria to recognize major insects at their diversity, distribution and ecological functions with all present the impacts of human activities on arthropolation, and what kind of problems or solution they represe	eflected in the diversity all trophic levels within all trophic levels within ititids, disease vectors of most ecosystems. Yet arger "charismatic" verteleries, revealing sometim fic imagination, and characteristic organisms and given ow to identify them corrected arachnids groups. The in ecosystems. Finally the ds, how they have been	of behaviour ecosystems. A for decomposer their important their second part we last part of the
ourse Learning Outcomes	On succe	ssful completion of this course, students should be able	to:	
	CLO 1 i	dentify major groups of insects and arthropods		
	CLO 2 u	understand and use the main collecting methods to sam	ple arthropod diversity	
	CLO 3 u	understand the ecological diversity of arthropod groups a	and their importance in ec	osystems
		understand the biotic and abiotic factors that drive telabundance	rrestrial arthropod specie	es richness an
	CLO 5	understand how human activities modify insect diversity		
	CLO 6	describe the multiple roles played by insects on human a	activities	
Pre-requisites and Co-requisites and mpermissible combinations)	Pass in B	IOL1309 Evolutionary diversity and BIOL2306 Ecology a	and evolution	
Offer in 2015 - 2016	Y 1st	sem	Examination	Dec
Offer in 2016 - 2017	Υ			
Course Grade	A+ to F			
Grade Descriptors	A	Demonstration of an excellent understanding of the biological co Master the identification skills and use of taxonomic keys of the active and participative attitude in class. Curation and identification standard as presented during the course.	different groups of arthropods	studied. Present a
	В	Demonstration of a good understanding of the biological concepts most of the identification skills and use of taxonomic keys of the ormore limited. Curation and identification of the collection satisfactors	different groups of arthropods. F	
	С	Demonstration of a general but incomplete understanding of the the course. Identification skills and use of taxonomic keys of the reliable identification. Participation in class very limited or irrelevareaching academic level.	different groups of arthropods in	sufficient to provid

	Identifica	Demonstration of a limited understanding of the biological concepts and theories devel Identification skills and use of taxonomic keys of the different groups of arthropods inadequa No participation in class or unsettling. Poor curation and identification of the collection.					
	identifica	ition skills and lack of know	edge on how	on the biological concepts and theories developed during the cours ge on how to use taxonomic keys. No participation in class or unsu actory or work not delivered on time.			
Course Type	Lecture with laborat	tory component course					
Course Teaching	Activities Details				No. of Hours		
& Learning Activities	Lectures					24	
	Laboratory			s part includes 4 hours ures about identification ation of arthropod collectio	and	28	
	Project work		inde	dents will co ependently their own in ection, curate and identify cimen collected		48	
	Reading / Self stud	iy				50	
Assessment Methods and Weighting	Methods	ethods Details		Weighting in final course grade (%)	As	sessment 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 online materials	New York, USA. 80	1 pages.		ons and communities. Ca		,	
Course Website	http://www.biosch.h	ku.hk/ecology/lsc/					

BIOL3501 Evolution (6 cre	dits)		Academic Year	2015		
Offering Department	Biologic	ll Sciences	Quota	50		
Course Co-ordinator	Dr M Su	n, Biological Sciences <i>(meisun@hku.hk)</i>				
Teachers Involved	Dr M Su	n, Biological Sciences				
Course Objectives	of conte adaptati	is the cornerstone of modern biology. The course imporary evolutionary biology, including the history con, speciation, and evolution as an explanatory fram see emphasizes the interplay between theory and exwith the process of science.	of evolutionary biology, evolution bework at all levels of biological	onary processes I organization.		
Course Contents & Topics	- The re - Cases Evolutio - Patterr - The ev Evolutio - Before - Darwir - The Me - The or - Geneti - Natura - Migrati Evolutio - Specie - Specia - Evoluti	sm dern Synthesis & beyond hanisms of Evolution gin of genetic variation: mutation c drift: evolution at random. selection, sexual selection, and adaptation. on and Biodiversity				
Course Learning Outcomes	On succ	essful 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 selection can lead to speciation					
	CLO 3	have an advanced understanding of the modern ev	olutionary theory			
	CLO 4	apply evolutionary thinking to real world probler conservation	ns in agriculture, medicine,	and biodiversity		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	BIOL2306 Ecology and evolution				

Offer in 2015 - 2016	N			Examination	ı			
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	ov	ceptionally good performance demons er a wide range of topics covered by familiar problems, showing strong ab sight and original thought in dealing with	the course, and skillful appl lities in critical thinking and	ications of concepts logical reasoning, v	theories in solving new or			
	B Good performance demonstrating capacity to use the appropriate concepts, a good understanding of the subject matter, and an ability to handle the problems and materials encountered in the subject, showing evidence of attaining most of the course learning outcomes.							
	pro	Adequate performance demonstrating some understanding of the subject matter, an ability to handle relatively simple problems, but showing incomplete command of knowledge required for attaining most of the expected course learning outcomes.						
	to							
	su							
Course Type	Lecture-based	course						
Course Teaching & Learning Activities	Activities		Details		No. of Hours			
	Lectures				36			
	Tutorials				12			
	Project work				12			
	Reading / Sel	fstudy			100			
Assessment Methods and Weighting	Methods	Details	Weighting course gr		ssessment Methods to CLO Mapping			
	Assignments			10	CLO 1,2,3,4			
	Essay			5	CLO 1,2,3,4			
	Examination			50	CLO 1,2,3,4			
	Presentation			10	CLO 1,2,3,4			
	Project reports	s including computer lab		15	CLO 1,2,3,4			
	Test			10	CLO 1,2,3,4			
Required/recommended reading and online materials		d S. Freeman: Evolutionary An uyma: Evolution, (3rd Edition, 9 ole.						
Course Website	http://moodle.h							
Additional Course Information	· '	Il be offered subject to a minim	ım enrollment number	and availability o	of teachers			

BIOL3502 Conservation of	genetics (6 credits)	Academic Year	2015
Offering Department	Biological Sciences	Quota	50
Course Co-ordinator	Dr M Sun, Biological Sciences (meisun@hku.hk)	·	'
Teachers Involved	Dr M Sun, Biological Sciences		
Course Objectives	The course aims to familiarize students with fundamenta genetics. The theories and methods will be taught with a reptiles, amphibians, fish, invertebrates, as well as plants to answer a range of important questions in real world cor	a balanced range of examples - s - to demonstrate how genetic of	mammals, birds
Course Contents & Topics	Introduction to conservation genetics. Part I. Evolutionary Genetics of Natural Populations: genetic diversity characterizing genetic diversity: single loci and quantitati evolutionary impacts of natural selection, mutation, migragenetic consequences of small population sizes; maintenance of genetic diversity; population genomics. Part II. Effects of Population Size Reduction: loss of genetic diversity in small populations; inbreeding; inbreeding depression; population fragmentation; genetically viable populations. Part III. From Theory to Practice: resolving taxonomic uncertainties and defining managenergenetic management of wild populations; genetic issues in introduced and invasive species;	ation and their interactions in larg	ge populations;

	- genetic	c manageme	nt of captive population nt for reintroduction; enetics in forensics ar		g species biology.		
Course Learning Outcomes	On succ	essful compl	letion of this course, s	students should	be able to:		
	CLO 1	demonstrate	e an advanced under	standing of the	concepts of conservatio	n geneti	CS .
			the criteria for dete		nservation status of er		
	CLO 3		•	zing genetic dive	ersity at population and	species	levels
					diversity, inbreeding,	•	
		evolutionary	potential in wild pop	ulations			
	CLO 5		e effects of habitat fr lications in managing	-	nd population size redus	ction on	genetic diversity
	CLO 6	species bio			solving taxonomic unce s, and in developing m		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	BIOL2306 E	cology and evolution	or BIOL3303 Co	onservation ecology or f	BIOL340	8 Genetics
Offer in 2015 - 2016	Y 2	nd sem			Examina	tion	May
Offer in 2016 - 2017	Υ				·		
Course Grade	A+ to F						
Grade Descriptors	A	over a wid	de range of topics covered	d by the course, an abilities in critical	nt understanding of the subjected skillful applications of conthinking and logical reasonities in the field.	cepts/theor	ies in solving new or
	В	Good performance demonstrating capacity to use the appropriate concepts, a good understanding of the smatter, and an ability to handle the problems and materials encountered in the subject, showing evidence of at most of the course learning outcomes.					
	С		but showing incomplete		ling of the subject matter, an a voledge required for attaining		
	D	to deal w		lems, but also der	st partial familiarity with the someonstrating serious deficiends.		
	Fail		atter, demonstrating deficie		g little evidence of learning, la gh to make it inadvisable to p		
Course Type	Lecture	with laborate	ory component course				
Course Teaching & Learning Activities	Activit	ies		Details	5		No. of Hours
& Learning Activities	Lecture	s					24
	Labora	tory					12
	Project	work					12
	Tutoria	ls					12
	Readin	g / Self study	1				100
Assessment Methods and Weighting	Method	ds	Details		Weighting in final course grade (%)		ssment Methods to CLO Mapping
	Assigni	ments			10	CL	O 1,3,4,5,6
	Essay				5	CL	O 1,2,3,4,5
	Examin	ation			50	С	LO 1,4,5,6
	Labora	tory reports			10		CLO 3
	Presen	tation			10	С	LO 1,4,5,6
	Project	report			5	(CLO 1,4,6
	Test				10	С	LO 1,4,5,6
		m et al: Intro	duction to Conservat	on Genetics (Ca	ambridge University Pre	ess, 2009	9, 2nd ed.)
Required/recommended reading and online materials		available					
reading	e-book a		1				

BIOL3503 Endocrinology: h	OL3503 Endocrinology: human physiology II (6 credits) Academic Year			
Offering Department	Biological Sciences	Quota	120	
Course Co-ordinator	Prof B K C Chow, Biological Sciences (bkcc@hku.hk)			

Teachers Involved			logical Sciences logical Sciences				
Course Objectives		To provide an advanced course on hormones and how they regulate metabolism/growth, reproduction an water/salt homeostasis in our body.					
Course Contents & Topics	signaling. The hyporathe hyporathe GHR stress. Ca The gastr The enter Regulation gastrin, Good intake. Insulin an Reproduce The GnRI Interaction actions of The men endocrine broodines Osmoregy Posterior	Secondary thalamic pitt H-GH-IGF a attecholamin cointestinal sric nervous n of acid season. SIP, CCK, s d glucagon. Struction H-gonadotron of hormon festosteror strual cycle a corgan. En ss. ulation pituitary h	axis. The TRH-TSH-thyroid e effects and their pathways system system. The cephalic phase ecretion. Regulation of pandecretin, GLP-1, GLP-2 and	hormone e, stoma creatic e; motilin. ulation of ells in th ale repro tion, fert rition. Ho e and s	channal effects. channal effects. channal effects. channal effects. channal endocrine sand effects to regulate spenductive system. Develop illization and implantation or monal control of milk endolum balance. Angiote	phase of ecretion. energy ba	food digestion Gut hormones lance and foo ductive systen esis. Biologica ovarian follicles olacenta as a
Course Learning Outcomes	On succe	ssful comple	etion of this course, students	s should l	be able to:		
	CLO 1	understand t	he definition and natures of	hormone	es		
	CLO 2	explain and	describe secondary messen	ger path	ways for hormones		
		describe the peripheral or	e connection between piturgans	itary the	master gland with hig	gher brain	n centers and
			describe hormones involve tabolism/growth, reproduction			nportant	oody functions
Pre-requisites and Co-requisites and mpermissible combinations)	Pass in B	IOL2103 Bio	ological sciences laboratory	course			
Offer in 2015 - 2016	Y 2nd	d sem			Examinati	on	May
Offer in 2016 - 2017	N						
Course Grade	A+ to F						
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all the coulearning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thougand ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effect organizational skills.					of original though
	В	learning outcomes. Show evidence of a			road range of knowledge required for attaining at least most of the course analytical and critical abilities and logical thinking, and ability to apply situations. Apply effective organizational skills.		
	С	C Demonstrate general but incomplete command of knowledge required for attaining most of the course learn outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to apply knowled to most familiar situations. Apply moderately effective organizational skills.					
	D						
	Fail	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.					
Course Type	Lecture w	ith laborato	ry component course				
Course Teaching	Activitie	s		Details	•		No. of Hours
& Learning Activities	Lectures						24
	Laborato	ory			ur laboratory session p or 5 weeks	er	25
	Tutorials	Tutorials					(
	Reading	/ Self study					100
	Methods		Details		Weighting in final course grade (%)		ment Methods
	Methods	•	Dotails		course grade (70)		CLO Mapping
	Methods Examina		Details		80		1,2,3,4
	Examina		lab performance & report		_ , ,	CLO	
Assessment Methods and Weighting Required/recommended reading and online materials	Examina Laborato Williams t	tion ory reports extbook of E			80 20 n, 2009).	CLO	1,2,3,4

Additional Course Information This course will be offered subject to a minimum enrollment number and availability of teachers. This course will be offered in alternative year.

•		storation (6 credits)		Academic Year			
Offering Department	Biological			Quota	20		
Course Co-ordinator	Dr T Veng	atesen, Biological Sciences (rajan@hku	.hk)				
Teachers Involved	Dr T Veng	atesen, Biological Sciences					
Course Objectives	Provide so Enable sto and restor Understan	larval biology and hatchery technology; cientific basis for coastal aquaculture throudents to design, construct and maintal ation of wild oysters; and the reasons for restoration of marine, cransfer of academic knowledge to aqua	n larval hatchery for estuarine and coasta	production of seed I ecosystems;			
Course Contents & Topics	and advar and maint interdiscip basic oys: Environme farming in also expltu aquacultu farming. T Kong. Stu from Univo opportunit Thus, stud	This experiential learning course is to enhance students' knowledge in applied larval biology techn and advanced coastal aquaculture production systems that will enable them to design, construct, or and maintain oyster aquaculture facilities for food production and restoration of wild population. This interdisciplinary endeavor encompassing larval hatchery technology and aquaculture. After reading basic oyster biology and coastal aquaculture, we will focus on hatchery technology and aquaculturound issues, legislation pertaining to coastal aquaculture will also be covered using farming in Hong Kong as an example. Students will learn why oyster habitat is declining in HK and also explore scientific and management ways to restore oyster habitat. Students will be exposed to aquaculture facilities in Hong Kong & will be taken to Penang (Malaysia) to learn practical skills of farming. This course is designed to meet the needs of an expanding sustainable aquaculture in Kong. Students will be exposed to a unique learning environment involving not only HKU but also tea from Universiti Sains Malaysia (USM), bringing with them diverse range of expertise, culture, and lead opportunities. Career and small scale business opportunities in aquaculture industry will be discutable to the provided adequate knowledge & analytical capabilities for a successful car larval biology research and aquaculture.					
Course Learning Outcomes	On succes	On successful completion of this course, students should be able to:					
		CLO 1 examine the influence of environmental variables on larval development and recruit consider the potential effects of these variables 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 farming					
	CLO 3 e	xplain the importance of oyster farming	n coastal habitat res	toration			
	CLO 4 p	lan and execute a commercially importa	nt research project ir	larval biology and	aquaculture		
Pre-requisites (and Co-requisites and Impermissible combinations)		IOL2103 Biological sciences laboratory logy or BIOL3303 Conservation ecology		Ecology and evolu	tion or BIOL330		
Offer in 2015 - 2016	Y 2nd	sem		Examination	No Exam		
Offer in 2016 - 2017	Υ				'		
Course Grade	A+ to F						
Grade Descriptors	A	Evidence of original thought during the analysis of larval biology issues. Show evidence of analytical, critical ar multidimensional thinking about the study subject. Extensive knowledge and skills required for attaining all the cours learning outcomes. Demonstrate excellent ability to apply what you have learned in the class room to critical analyze the larval biology project data. Show highly effective organizational, presentational and field trip skills.					
	В	Show substantial knowledge and thought during the analysis of marine life science issues. Show substanti knowledge and thought during the analysis of marine life science issues. Show some evidence of some analytic 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 critical analyze the real marine life science issues. Show effective organizational, presentational and field trip skills.					
	С	Show general but incomplete knowledge and original thought during the analysis of marine life science isst knowledge and skills required for attaining all the course learning outcomes. Demonstrate fair ability to ap you have learned in the class room to critically analyze the real marine life science issues. Show consorganizational, presentational and field trip skills.					
		Evidence to show a minimum knowledge (i.e. knowledge is very incomplete) and thought during the anal marine life science issues. Show insufficient knowledge and skills required for attaining all the course le outcomes. Demonstrate poor ability to apply what you have learned in the class room to critically analyze the marine life science issues. Show very little organizational, presentational and field trip skills.					
	D	marine life science issues. Show insufficient outcomes. Demonstrate poor ability to apply v	knowledge and skills re what you have learned in	quired for attaining all the class room to critical	the course learning		
	Fail	marine life science issues. Show insufficient outcomes. Demonstrate poor ability to apply v	knowledge and skills re what you have learned in unizational, presentational and understanding of man the course learning outcome yze the real marine life sci	quired for attaining all the class room to critica and field trip skills. ine life science issues. S les. Demonstrate no abil ience issues. Show no e	the course learning ally analyze the real show no evidence of ity to apply what you vidence of familiarity		
Course Type		marine life science issues. Show insufficient outcomes. Demonstrate poor ability to apply a marine life science issues. Show very little orgation in the science of meager or inadequate knowledge knowledge and skills required for attaining all thave learned in the class room to critically anal with relevant reading material and field trip deskills.	knowledge and skills re what you have learned in unizational, presentational and understanding of man the course learning outcome yze the real marine life sci	quired for attaining all the class room to critica and field trip skills. ine life science issues. S les. Demonstrate no abil ience issues. Show no e	the course learning ally analyze the real show no evidence of ity to apply what you vidence of familiarity		
Course Teaching	Fail Field camp	marine life science issues. Show insufficient outcomes. Demonstrate poor ability to apply a marine life science issues. Show very little orgation in the science issues. Show very little orgation is supported by the science issues. Show very little orgation is supported by the science is supported by the scien	knowledge and skills re what you have learned in inizational, presentational and understanding of mar ne course learning outcom yze the real marine life sci emonstrations, or any kno	quired for attaining all the class room to critica and field trip skills. ine life science issues. S les. Demonstrate no abil ience issues. Show no e	the course learning ally analyze the real Show no evidence of ity to apply what you vidence of familiarity I and presentational		
Course Teaching	Fail Field camp	marine life science issues. Show insufficient outcomes. Demonstrate poor ability to apply a marine life science issues. Show very little orgation in the science issues. Show very little orgation is supported by the science issues. Show very little orgation is supported by the science is supported by the scien	knowledge and skills re what you have learned in unizational, presentational and understanding of man the course learning outcome yze the real marine life sci	quired for attaining all the class room to critica and field trip skills. ine life science issues. S les. Demonstrate no abil ience issues. Show no e	the course learning ally analyze the rea Show no evidence of try to apply what you vidence of familiarity I and presentationa		
Course Teaching	Fail Field camp Activities Lectures	marine life science issues. Show insufficient outcomes. Demonstrate poor ability to apply warrine life science issues. Show very little orgate is before the science of meager or inadequate knowledge knowledge and skills required for attaining all the three learned in the class room to critically anal with relevant reading material and field trip deskills.	knowledge and skills re what you have learned in inizational, presentational and understanding of mar ne course learning outcom yze the real marine life sci emonstrations, or any kno	quired for attaining all the class room to critica and field trip skills. ine life science issues. S les. Demonstrate no abil ience issues. Show no e	the course learning ally analyze the real show no evidence of ity to apply what you vidence of familiarity I and presentational No. of Hours		
Course Teaching	Fail Field camp Activities Lectures Field wor	marine life science issues. Show insufficient outcomes. Demonstrate poor ability to apply a marine life science issues. Show very little orgation in the science of meager or inadequate knowledge knowledge and skills required for attaining all thave learned in the class room to critically anal with relevant reading material and field trip deskills.	knowledge and skills re what you have learned in inizational, presentational and understanding of mar ne course learning outcom yze the real marine life sci emonstrations, or any kno	quired for attaining all the class room to critica and field trip skills. ine life science issues. S les. Demonstrate no abil ience issues. Show no e	the course learning ally analyze the real show no evidence of the total show no evidence of the total show no evidence of familiarity I and presentational No. of Hours		
Course Type Course Teaching & Learning Activities	Fail Field camp Activities Lectures	marine life science issues. Show insufficient outcomes. Demonstrate poor ability to apply a marine life science issues. Show very little orgation in the science of meager or inadequate knowledge knowledge and skills required for attaining all thave learned in the class room to critically anal with relevant reading material and field trip deskills.	knowledge and skills re what you have learned in inizational, presentational and understanding of mar ne course learning outcom yze the real marine life sci emonstrations, or any kno	quired for attaining all the class room to critica and field trip skills. ine life science issues. S les. Demonstrate no abil ience issues. Show no e	the course learning ally analyze the real show no evidence of ity to apply what you vidence of familiarity		

	Reading / Self s	tudy		20			
	Assessment			10			
Assessment Methods and Weighting	Methods	Methods Details		Assessment Methods to CLO Mapping			
	Assignments		25	CLO 3,4			
	Report	Presentation: developing innovative ideas for sustainable and economically viable aquacultre in Hong Kong	50	CLO 4			
	Test		25	CLO 1,2			
Required/recommended reading and online materials	Shellfish Aquacu	Ecology of Marine Invertebrate Larvae (Larry McEdward, CRC Press) Shellfish Aquaculture and the Environment (S.E. Shumway, John Wiley & Sons) Molluscan Shellfish Farming (Brian Spencer, John Wiley & Sons)					
Course Website	http://www.bioscl	h.hku.hk/ecology/lsc/					
Additional Course Information	This course will b	pe offered subject to a minimum enro	ollment number and availa	bility of teachers.			

	versity fi	eld course (6 credits)	Academic Year	2015				
Offering Department	Biologic	al Sciences	Quota	20				
Course Co-ordinator	Dr L Kaı	Or L Karczmarski, Biological Sciences (leszek@hku.hk)						
Teachers Involved	Dr L Kaı	Dr L Karczmarski, Biological Sciences						
Course Objectives		his course is offered as a capstone experience and will require intense study of a topic relevant to he Ecology & Biodiversity Major during a field course, inside or outside Hong Kong.						
Course Contents & Topics	best sui	Every year a number of different potential courses may be offered. The precise contents will be tailor best suit the topic and locality involved and will therefore vary according to the specific course being The basic contents will involve lectures, seminars and extensive field and follow-up laboratory work essential that students contact the course coordinator for further information on the courses available.						
Course Learning Outcomes	On succ	essful completion of this course, students should b	e able to:					
	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 fie	ld course				
	CLO 3	be knowledgeable about and able to impleme particular ecosystems studied	nt sampling techniques for o	organisms in th				
	CLO 4 understand the basic ecology of target species and how biotic and abiotic communities							
Pre-requisites (and Co-requisites and Impermissible combinations)	(BIOL3) This cap	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences cour (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.						
Offer in 2015 - 2016	Y 2	nd sem	Examination	No Exam				
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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.						
	В	Evidence of a good grasp of the subject and relevant research techniques. Interest in learning and good-to-mod familiarity with relevant background reading and case studies. Good handling of field data collection commendable analytical skills. Good evidence of critical thought (although not always independent), wit appreciable use of fundamental concepts and consideration of broader comparative perspective in drawing loconclusions. Good abilities of independent work, effective presentation skills with logical and analygementation. 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. I familiarity with relevant background reading and case studies, but no interest in learning beyond the average level. Evidence of logical critical thinking (although not always independent), with mostly goo fundamental concepts to draw logical conclusions. Fair presentation skills, with mostly correct arguments 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 conce and research techniques. Some familiarity with relevant case studies, but insufficient evidence of background read and limited abilities of critical independent thinking. Ineffective presentation skills with generally weak log argumentation with restricted ability of drawing appropriate conclusions. Work barely meets what is required degree level.							
			·	what is required				
	Fail		nt examples and case studies. Ina	iques. No evidence				
Course Type	Fail Field ca	degree level. No evidence of basic a minimum grasp of the subject and background reading and no familiarity with any releva coherent logical thought; ineffective presentation skills with conclusions. Work fails to reach degree level.	nt examples and case studies. Ina	iques. No evidence dequate evidence				

	Field work			42
	Reading / Self st	udy		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		35	CLO 1,2,3,4
	Report	project report (35%), group investigation & presenation (30%)	65	CLO 1,2,3,4
Required/recommended reading and online materials	Students will be o	lirected to relevant scientific literautre	e and websites	
Course Website	http://www.biosch	n.hku.hk/ecology/lsc/		
Additional Course Information	Subclass A: Marin Subclass B: Anim Enrollment Proce The course is of required to submit a brief ((leszek@hku.hk) 1. Personal and a 2. ID photograph 3. Brief descriptio 4. GPA	oen to enrollment only during the a maximum 1-page) application letter (not later than 11 January 2016. The academic details n of academic interests	add/drop period of the 2 (PDF file) via e-mail to the application shall include t	e Course Coordinator he following:
	waiver) All applications w	ourses taken and grades received (if ill be reviewed prior to the commence the 1st week of the add/drop period	· ement of the 2nd semeste	•

BIOL3991 Directed studies	s in ecolo	gy & biodiversity (6 credits)	Academic Year	2015			
Offering Department	Biological Sciences Quota						
Course Co-ordinator	Prof G A Williams, Biological Sciences (hrsbwga@hku.hk)						
Teachers Involved	All academic staff in Ecology & Biodiversity Major, Biological Sciences						
Course Objectives	dissertation a desk-top to develop	will undertake a dissertation on a topic related to the number of the number of labors of study. Conducting a dissertation is an independent less skills including the use of library and Web-based resors; written presentation skills; and personal time manager	ratory or fieldwork, but warning experience and wurces; the logical develo	rill take the form o ill enable students			
Course Contents & Topics	member of limited an	An appropriate dissertation topic will be selected from a predeterminted list and following discussion of member of Ecology & Biodiversity staff, who will act as the student's supervisor. Formal teaching we limited and aimed at introducing students to the techniques necessary for successful completion of dissertation.					
Course Learning Outcomes	On succes	ssful completion of this course, students should be able	0:				
	CLO 1 id	dentify a relevant scientific question or knowledge gap					
	CLO 2 establish a desk-top literature approach to test the question posed / address the l						
	CLO 3 undertake the appropriate research to test the question / address the knowledge gap using sound scientific principles; including statistical analyses where appropriate						
	CLO 4 d	lraw appropriate scientific conclusions from their researc	h				
	CLO 5 p	resent their research as a scientific paper					
Pre-requisites (and Co-requisites and Impermissible combinations)	(BIOL3XX	at least 24 credits of advanced level disciplinary (X or BIOL4XXX) in the Ecology & Biodiversity Major. tone course is for Ecology & Biodiversity Major students st that a student is allowed to take this capstone course	only.	sciences courses			
Offer in 2015 - 2016	Y Yea	ar long	Examination	No Exam			
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	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 scientific approach to test research hypothesis. Show excellent organizational and/or analytical skills. Demonstrate comprehensive, critical, assessment of findings 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 scientific approach to test research hypothesis. Show good organizational and/or analytical skills. Demonstrate effective, critical, assessment of findings 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 scientific approach to test research hypothesis. Show fair organizational						

	and/or a research	nalytical skills. Demonstrate adequate b work.	out not i	necessarily critical, assessn	nent of fir	ndings and presentation of	
	of the lea	e of limited understanding and grasp of arning outcomes. Limited critique and kn lesigned scientific approach to test re trate confused and poorly organized ass	owledg search	e of relevant literature and in hypothesis. Show fair org	dentificati anization	on of research hypothesis. al and/or analytical skills.	
	are not designed	are not attained. Poor critique and knowledge of relevant literature and identification of research designed scientific approach to test research hypothesis. Show little evidence of appropriate analytical skills. Demonstrate incorrect interpretation and assessment of findings and poor pr					
Course Type	Project-based cours	se					
Course Teaching	Activities	Activities			Details		
& Learning Activities	Reading / Self stud	study		at least 120 hours on the dissertation or project		120	
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	A	ssessment Methods to CLO Mapping	
	Research report	Mid-term written essay (20%), Written report 6000- words (excluding figures references) (80%)	report 6000-7000 ing figures and			CLO 1,2,3,4,5	
Course Website	http://www.biosch.h	ku.hk/ecology/lsc/					
Additional Course Information	methods, and on h	between the supervisor and s now to think and write scientific ect. Recommended reading may	cally.	Students should spen	•		

	s in 100a	in food & nutritional science (6 credits) Academic Year						
Offering Department	Biologica	Sciences	Quota					
Course Co-ordinator	Prof H Co	Prof H Corke, Biological Sciences (harold@hku.hk)						
Teachers Involved	All acade	All academic staff in Food & Nutritional Science Major, Biological Sciences						
Course Objectives		his course aims to provide a stimulating capstone experience for all Food & Nutritional Science indergraduates to integrate and apply their knowledge and skills obtained from the Major.						
Course Contents & Topics	student's commitme course (a methodol	ted study can be a review of literature on a specific topic, understanding of the topic in the field of food & nutritiona ent of a supervisor in the area of the dissertation topic befovailable from the General Office of School of Biological Sciogies/techniques and guide students to completion of the ents will gain knowledge through discussion and feedback f	I science. The student ire submitting the registricences). Supervisor will dissertation. Teaching	should obtain thation for the introduce variou				
Course Learning Outcomes	On succe	ssful completion of this course, students should be able to:						
	CLO 1	acquaint with the process of scientific enquiry						
	CLO 2	have a better understanding of the nature of food & nutrition	onal science					
	CLO 3	apply scientific methods to address important issues in va	rious biological disciplin	es				
	CLO 4	develop the key intellectual skills that will be valubale for a	all scientific studies					
Pre-requisites (and Co-requisites and Impermissible combinations)	(BIOL3X) This caps	at least 24 credits of advanced level disciplinary co (X or BIOL4XXX) in the Food & Nutritional Science Major. tone course is for Food & Nutritional Science Major studenest that a student is allowed to take this capstone course is	ts only.	ciences course				
Offer in 2015 - 2016	Y Ye	ar long	Examination	No Exam				
		aeg						
Offer in 2016 - 2017	Υ							
	Y A+ to F							
Offer in 2016 - 2017 Course Grade Grade Descriptors		Work displaying a high level of scholarship and originality; virtually f dissertation topic, showing a thorough grasp of the topic from backgr objectives of the research; comprehensive exploration of the topic support from the literature; comprehensive and up-to-date reference critical evaluations of the main points or problems and their solutions accurate summary. All chapters/paragraphs are well-connected demonstrating excellent organizational, rhetorical and presentations specified requirements. All other aspects of the dissertation conform to	ound reading and analysis; c c, personal synthesis of the es integrated into argument of s and implications; thought-pr and presented logically wi al skills. The length of the d	lear statement of the issues with detailed or logical reasoning ovoking discussions th clarity of goals				
Course Grade	A+ to F	Work displaying a high level of scholarship and originality; virtually ff dissertation topic, showing a thorough grasp of the topic from backgr objectives of the research; comprehensive exploration of the topic support from the literature; comprehensive and up-to-date reference critical evaluations of the main points or problems and their solutions accurate summary. All chapters/paragraphs are well-connected demonstrating excellent organizational, rhetorical and presentations	ound reading and analysis; c c, personal synthesis of the es integrated into argument c and implications; thought-pr and presented logically wi al skills. The length of the do a high academic standard. lying, generating and comm rrating substantial understan background reading and an ment or appraisal; regular si ain points fully elaborated; si y and fluently, demonstrating	lear statement of th issues with detaile or logical reasoning provision discussions the clarity of goals issertation meet th unicating competin ding of fundamenta alysis; a systemati upport provided for ummary given in th good organizationa				

		reported and tabulated, etc.); few typos or grammatical errors; Most aspects conform to an acceptable academic standard.					
	the bar showing structur repeatir well inc	strating superficial or partial or faulty un- e minimum of information, poorly diges no evidence of critical thinking; argun e in communicating information or ide g the data or findings; overuse quotation proprated into the text; limited acknowle to an acceptable academic standard.	sted and nents und as. disse ns with lit	not very well organized in developed or inappropriate of ertation topic not fully cove tle explanation; insufficient s	present or unsu red; dis upport f	tation; irrelevant material; pported; lack of clarity or scussion too brief or just from literature; reading not	
	underst informa reading	The dissertation topic was not covered acceptably; demonstrating evidence of poor knowledge, clear deficiencies understanding fundamental concepts; materials largely irrelevant; incomplete or confusing communication information or ideas; unreflective; incoherent argument; complete misinterpretation of the topic or data; no evidence reading (no acknowledgements or bibliography); structure confused or not discernible; Fail to meet most or all of basic requirements of the course. The written work is not of an academic standard.					
Course Type	Project-based cour	se					
Course Teaching & Learning Activities	Activities		Details No. of Hours				
a Learning Activities	Reading / Self stu	dy		east 120 hours on tation or project	the	120	
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	As	ssessment Methods to CLO Mapping	
	Oral presentation	15 minutes (Plus 5 minutes for questions and answers).		20		CLO 1,2,3,4	
	Research report	Written report 6000-8000 (excluding figures references).	words and	80		CLO 1,2,3,4	
Course Website	http://moodle.hku.h	ıl/					
Additional Course Information	methods, and on	between the supervisor and s how to think and write scientifi ect. Recommended reading may	cally. S	Students should spend			

	s in Mole	cular biology & biotechnology (6 credits)	Academic Year	2015			
Offering Department	Biologica	l Sciences	Quota				
Course Co-ordinator	Dr W K Y	or W K Yip, Biological Sciences <i>(wkyip@hku.hk)</i>					
Teachers Involved	All acade	mic staff in Molecular Biology & Biotechnology Major, Biolo	ogical Sciences				
Course Objectives		his course aims to provide a stimulating capstone experience for all Molecular Biology & Biotec lajor undergraduates to integrate and apply their knowledge and skills obtained from the Major.					
Course Contents & Topics	student's obtain the form for introduce	The directed study can be a review of literature on a specific topic, or a lab or field study that enhal student's understanding of the topic in the field of molecular biology & biotechnology. The stude obtain the commitment of a supervisor in the area of the dissertation topic before submitting the reform for the course (available from the General Office of School of Biological Sciences). Superintroduce various methodologies/techniques and guide students to completion of the dissertation. will be informal and students will gain knowledge through discussion and feedback from their superv					
Course Learning Outcomes	On succe	essful completion of this course, students should be able to:	:				
	CLO 1	acquaint with the process of science					
	CLO 2	have a better understanding of the nature of molecular bio	ology & biotechnology	ју & biotechnology			
	CLO 3	apply scientific methods to address important issues in va	rious biological disciplin	us biological disciplines			
	CLO 4 develop the key intellectual skills that will be valubale for all scientific studies						
(and Co-requisites and	(BIOL3X) This caps	at least 24 credits of advanced level disciplinary co XX or BIOL4XXX) in the Molecular Biology & Biotechnology stone course is for Molecular Biology & Biotechnology Majo est that a student is allowed to take this capstone course is	ore/elective biological s / Major. or students only.	sciences course			
(and Co-requisites and Impermissible combinations)	(BIOL3X) This caps The earlie	XX or BIOL4XXX) in the Molecular Biology & Biotechnology stone course is for Molecular Biology & Biotechnology Majo	ore/elective biological s / Major. or students only.	cciences course			
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016	(BIOL3X) This caps The earlie	XX or BIOL4XXX) in the Molecular Biology & Biotechnology stone course is for Molecular Biology & Biotechnology Majo est that a student is allowed to take this capstone course is	ore/elective biological s y Major. or students only. their year 3 study.				
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	(BIOL3X) This caps The earlie Y Ye	XX or BIOL4XXX) in the Molecular Biology & Biotechnology stone course is for Molecular Biology & Biotechnology Majo est that a student is allowed to take this capstone course is	ore/elective biological s y Major. or students only. their year 3 study.				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017	(BIOL3X) This caps The earlie Y Ye	XX or BIOL4XXX) in the Molecular Biology & Biotechnology stone course is for Molecular Biology & Biotechnology Majo est that a student is allowed to take this capstone course is	pre/elective biological sy Major. or students only. or their year 3 study. Examination flawless presentation with excround reading and analysis; c, personal synthesis of the reas integrated into argument s and implications; thought-pr and presented logically will al skills. The length of the description of the des	No Exam Hellent introduction lear statement of the issues with detaile or logical reasonin vovking discussion the clarity of goal			
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	(BIOL3X) This caps The earlie Y Ye Y A+ to F	XX or BIOL4XXX) in the Molecular Biology & Biotechnology stone course is for Molecular Biology & Biotechnology Majo est that a student is allowed to take this capstone course is ar long Work displaying a high level of scholarship and originality; virtually f dissertation topic, showing a thorough grasp of the topic from backgr objectives of the research; comprehensive exploration of the topic support from the literature; comprehensive and up-to-date reference critical evaluations of the main points or problems and their solutions accurate summary. All chapters/paragraphs are well-connected demonstrating excellent organizational, rhetorical and presentations.	rer/elective biological sy Major. Major. Their year 3 study. Examination Examin	No Exam Rellent introduction lear statement of the issues with detailed or logical reasonin the clarity of goal issertation meet the unicating competing of fundament alysis; a systemat upport provided frommary given in the good organizations.			

	D	Demonstrathe bare in	nd tabulated, etc.); few typos or gr uting superficial or partial or faulty un ninimum of information, poorly diges o evidence of critical thinking; argur	derstandi	ng of the fundamental concep not very well organized in p	ots of the	e field of study; showing tion; irrelevant material;
		structure in repeating well incorp	n communicating information or ide the data or findings; overuse quotation orated into the text; limited acknowle an acceptable academic standard.	as. dissens with lit	ertation topic not fully cover- tle explanation; insufficient su	ed; disci	ussion too brief or just om literature; reading not
	Fail	The dissertation topic was not covered acceptably; demonstrating evidence of poor knowledge, clear deficien understanding fundamental concepts; materials largely irrelevant; incomplete or confusing communical information or ideas; unreflective; incoherent argument; complete misinterpretation of the topic or data; no evide reading (no acknowledgements or bibliography); structure confused or not discernible; Fail to meet most or all basic requirements of the course. The written work is not of an academic standard.					sing communication of c or data; no evidence of
Course Type	Project-bas	sed course	•				
Course Teaching & Learning Activities	Activities	Activities			Details		No. of Hours
& Learning Activities	Reading /	Reading / Self study		at least 120 hours on the dissertation or project		the	120
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Ass	sessment Methods to CLO Mapping
	Methods Oral prese	entation	Details 15 minutes (Plus 5 minute questions and answers).	es for			
			15 minutes (Plus 5 minute		course grade (%)	(to CLO Mapping

BIOL3994 Directed studies	s in biolo	s in biological sciences (6 credits) Academic Yea						
Offering Department	Biologica	Sciences	Quota					
Course Co-ordinator	Dr J S H	Or J S H Tsang, Biological Sciences (jshtsang@hku.hk)						
Teachers Involved	All acade	All academic staff in Biological Sciences Major, Biological Sciences						
Course Objectives		his course aims to provide a stimulating capstone experience for all Biological Sciences Indergraduates 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 enhance tudent's understanding of the topic in the field of biological sciences. The student should obtain ommitment of a supervisor in the area of the dissertation topic before submitting the registration form ourse (available from the General Office of School of Biological Sciences). Supervisor will introduce whethodologies/techniques and guide students to completion of the dissertation. Teaching will be in the students will gain knowledge through discussion and feedback from their supervisors.						
Course Learning Outcomes	On succe	essful completion of this course, students should be able to:						
	CLO 1	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 vari	ous biological disciplir	ciplines				
	CLO 4	develop the key intellectual skills that will be valuable for all	scientific studies					
Pre-requisites (and Co-requisites and Impermissible combinations)	(BIOL3X) This caps	at least 24 credits of advanced level disciplinary core (XX or BIOL4XXX) in the Biological Sciences Major. stone course is for Biological Sciences Major students only. Lest that a student is allowed to take this capstone course is the state of the course is the course of the course is the course of the course is the course of the course	v	sciences course				
Offer in 2015 - 2016	Y Ye	ar long	Examination	No Exam				
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	Work displaying a high level of scholarship and originality; virtually flawless presentation with excellent introduction to dissertation topic, showing a thorough grasp of the topic from background reading and analysis; clear statement of the objectives of the research; comprehensive exploration of the topic, personal synthesis of the issues with detailed support from the literature; comprehensive and up-to-date references integrated into argument or logical reasoning; critical evaluations of the main points or problems and their solutions and implications; thought-provoking discussions; accurate summary. All chapters/paragraphs are well-connected and presented logically with clarity of goals, demonstrating excellent organizational, rhetorical and presentational skills. The length of the dissertation meet the specified requirements. All other aspects of the dissertation conform to a high academic standard.						
	В	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						

		rhetorical	er/paragraphs; communicating inform and presentational skills. The length a high academic standard.				
	С	compreher the main pacceptable given in the	ving no evidence of originality and in sion of most aspects of the dissertal coints presented in logically sequent interpretation of the topic, some exp le final chapter/paragraphs; most pre and tabulated, etc.); few typos or gr	tion topic tial para planation esentatio	; essential topic materials h graphs; reasonably balance , illustration and support pro n details met (front page, r	ave been red discussion of the	ead and acknowledged; on of the major issues; the literature; summary bility, citations correctly
	D	the bare r showing n structure i repeating t well incorp	ating superficial or partial or faulty un ninimum of information, poorly diges o evidence of critical thinking; argur n communicating information or ide the data or findings; overuse quotatio orated into the text; limited acknowle an acceptable academic standard.	sted and nents ur eas. diss ns with li	not very well organized in developed or inappropriate ertation topic not fully cov ttle explanation; insufficient	n presentat or unsupp ered; discu support from	ion; irrelevant material; orted; lack of clarity or assion too brief or just m literature; reading not
	Fail	understand information reading (no	tation topic was not covered accept, ding fundamental concepts; materi o or ideas; unreflective; incoherent ar o acknowledgements or bibliography irements of the course. The written was	ials larg gument;); structu	ely irrelevant; incomplete complete misinterpretation of tre confused or not discerni	or confus	ing communication of or data; no evidence of
Course Type	Project-b	ased course	1				
Course Teaching & Learning Activities	Activities			Detai	Details No. of Hours		
a Learning Activities	Reading	g / Self study	Self study		at least 120 hours on dissertation or project		120
Assessment Methods and Weighting	Method	ls	Details		Weighting in final course grade (%)	Ass	essment Methods to CLO Mapping
	Oral pre	esentation	15 minutes (Plus 5 minut questions and answers).	15 minutes (Plus 5 minutes for questions and answers).		(CLO 1,2,3,4
	Researc	Research report (excluding figures and references).			80	(CLO 1,2,3,4
Course Website	http://mo	odle.hku.hk/					
Additional Course Information	methods	, and on ho	etween the supervisor and sow to think and write scientifit. Recommended reading may	cally.	Students should spend		

BIOL4201 Public health nu	itrition (6	rition (6 credits) Academic Year						
Offering Department	Biologic	Biological Sciences Quota 90						
Course Co-ordinator	Dr J M F	Dr J M F Wan, Biological Sciences (jmfwan@hku.hk)						
Teachers Involved	Dr J M F	Dr J M F Wan, Biological Science						
Course Objectives	human	Public health nutrition unites social sciences and biomedical sciences in preventing disease and imp human health through programs aimed at enhancing good nutritional practices. This course pres broad overview of the professional practice and essential skills required of a public health nutritionist.						
Course Contents & Topics	The epic and ove public h	Public health nutrition: overview, nature and identification of problems, objectives of intervention problems are problems, objectives of intervention problems						
Course Learning Outcomes	On succ	essful completion of this course, students should	be able to:					
	CLO 1 have a broad knowledge of the scope and methodologies of public health nutrition							
	CLO 2 have a clear technical understanding of a range of selected examples of public health nutrition cases in less-developed and developed countries							
	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 health outcomes	on community food choices and	consequently on				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	BIOL3201 Food chemistry or BIOL3202 Nutrition	al biochemistry					
Offer in 2015 - 2016	Y 2	d sem	Examination	May				
Offer in 2016 - 2017	Υ		'	·				
Course Grade	A+ to F							
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Thorough grasp of the subject. 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 laboratory/fieldwork skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.						

	cou logi org.	nonstrate substantial command of a broad rse learning outcomes. Substantial grasp cal thinking, and ability to apply knov anizational and presentational skills. App a of results to draw appropriate conclusion	o of the subject. Show evidence of vledge to familiar and some unf ly effective laboratory /fieldwork ski	analytical and critical abilities and familiar situations. Apply effective ills and techniques. Correct use of			
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. General but incomplete grasp of the subject. 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 laboratory / 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.						
	out evid app par						
	oute abil Org labe	nonstrate little or no evidence of comma comes. Little or no grasp of the knowle- tities, logical and coherent thinking. Sh- anization and presentational skills are m pratory / fieldwork skills and technique clusions. Organization and presentational	dge and understanding of the subjow very little or no ability to apprint to apprint and the subjective or ineffective. Apps. Misuse of data and results at	ject. Lack of analytical and critical by knowledge to solve problems. By minimally effective or ineffective and/or unable to draw appropriate			
Course Type	Lecture-based	course					
Course Teaching	Activities		Details	No. of Hours			
& Learning Activities	Lectures			24			
	Tutorials		30 hours student invest report, & 12 hours tutorials/presentations				
	Reading / Self	Reading / Self study					
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments		30	CLO 1,2,3,4			
	Examination		70	CLO 1,2,3,4			
Required/recommended reading and online materials		utrition (The Nutrition Society Tex Margetts, JM Kearney, L Arab (E					
Course Website	http://moodle.hl	ku.hk/					
Additional Course Information	This course will	be offered subject to a minimum	enrollment number and availa	ability of teachers.			

BIOL4204 Diet, brain functi	ion and b	pehavior (6 credits)	Academic Year	2015			
Offering Department	Biologic	al Sciences	Quota	40			
Course Co-ordinator	Dr E T S	Dr E T S Li, Biological Sciences (etsli@hku.hk)					
Teachers Involved	Dr E T S	Dr E T S Li, Biological Sciences					
Course Objectives	To highlight the impact of nutrient provision on brain structure and function, and to discuss various effects of nutrition and diet on mental function and behaviour.						
Course Contents & Topics	Fundamentals of the central nervous system; Nutrition & brain development; Diet, learning & memory function; Dietary CNS stimulants; Neurotransmitters, drugs & behaviour; Physiological and socio-cultural determinants of dietary behaviour.						
Course Learning Outcomes	On succ	essful completion of this course, students should be able	to:				
	CLO 1	CLO 1 understand the basic structure and functions of the brain and how nutrition influences its development					
	CLO 2	CLO 2 be able to explain the consequences of nutrient inadequacy on cognition					
	CLO 3 understand the differences between bioactive food ingredients and drugs						
	CLO 4 critically evaluate and interpret the internal and external cues that determine dietary behaviour						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOL3204 Nutrition and the life cycle or already enrolled in this course						
Offer in 2015 - 2016	N		Examination				
Offer in 2016 - 2017	Υ	Υ					
Course Grade	A+ to F						
Grade Descriptors	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 scientific data and draw appropriate conclusions. Demonstrate highly effective presentation / writing skills.						
	B Demonstrate substantial grasp of the subject matter covered. Show full ability on knowledge integration, problem identification and solving. Show reasonable ability to critically analyze and interpret scientific data and draw appropriate conclusions. Demonstrate effective presentation / writing skills.						
	С	С					

	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 data and draw proper conclusions. Demonstrate adequate organization / writing skills.				
	D Demonstrate partial but limited grasp, with retention of some relevant information, of the subject matter covered. Misunderstanding of the materials is not uncommon. Show limited ability on knowledge integration, problem identification and solving. Use elementary approaches to analyze and interpret scientific data and draw sometimes erroneous conclusions. Demonstrate basic organization / writing skills.				
	cohe	onstrate little or no grasp, with retention rent and logical thinking, and minimal c lems. Seriously deficient in ability to an organization / writing skills.	ompetence in problem solving. Fail	to integrate information and identify	
Course Type	Lecture-based c	ourse			
Course Teaching	Activities		Details	No. of Hours	
& Learning Activities	Lectures			36	
	Tutorials		tutorials/group discussions/seminars	12	
	Reading / Self s	study		100	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignments		20	CLO 1,2,4	
	Examination		60	CLO 1,2,3,4	
	Presentation		20	CLO 2,4	
	1 resentation		20	CLO 2,4	
Required/recommended reading and online materials	Copper J. R., BI Press, 2003 Lieberman H. R. Nutritional Neuro	oom F. E. & Roth R. H.: The Bir , Kanarek R. B. & Prasad C.: Nu oscience (Journal) Behavior (Journal)	ochemical Basis of Neuropha	rmacology. Oxford University	
reading	Copper J. R., BI Press, 2003 Lieberman H. R. Nutritional Neuro	, Kanarek R. B. & Prasad C.: Nu oscience (Journal) Behavior (Journal)	ochemical Basis of Neuropha	rmacology. Oxford University	

BIOL4205 Food processing	g and eng	gineering (6 credits)	Academic Year	2015			
Offering Department	Biologica	al Sciences	Sciences Quota				
Course Co-ordinator	Dr J C Y	Dr J C Y Lee, Biological Sciences (jettylee@hku.hk)					
Teachers Involved		Dr J C Y Lee, Biological Sciences Prof N P Shah, Biological Sciences					
Course Objectives	To provide students with basic principles and methodologies of food processing and preservatio technology. To cover key engineering principles relevant to the food industry. Students will gain hands-o experience with selected food processing and preservation techniques.						
Course Contents & Topics	propertie effective processe convenie principle	Food processing is a multidisciplinary field combining applied physical sciences with knowledge of product properties and requirements. This course introduces the technical knowledge required to implement cost effective production and commercialization of food products and services. The design and development of processes, equipment and machinery used to convert raw agricultural materials and ingredients into safe convenient, and nutritious consumer food products are covered. We discuss the basic engineering principles and applications of methods in food processing and preservation. Techniques discussed wi include those for high and low temperature processing, concentration, dehydration, baking and extrusion.					
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1	O 1 understand basic principles of food processing methods and preservation technology					
	CLO 2 be able to apply their knowledge and practical skills to process and develop food products						
	CLO 3 demonstrate in-depth understanding of selected methods and problems in food processing and preservation						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOL3201 Food chemistry						
Offer in 2015 - 2016	Y 19	st sem	Examination	Dec			
Offer in 2016 - 2017	Υ		'				
Course Grade	A+ to F	A+ to F					
Grade Descriptors	A Demonstrate thorough grasp of the subject matter covered. Show strong evidence of analytical and critical abilities of the changes that take place in variety of food during preparation, processing and storage. Identifies and used advanced techniques and equipment for a variety of food-specific purposes. Demonstrates advance skills in designing, producing and evaluating solutions of excellent quality for specific food purposes. Critically use lab skills and techniques and analysis of data and results to draw appropriate and insightful conclusions.						
	B Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities of the changes that take place in variety of food during preparation, processing and storage. Identifies and uses techniques and equipment for a variety of food-specific purposes. Demonstrates high-level skills in designing, producing and evaluating solutions of high quality for specific food purposes. Use lab skills and techniques and analysis of data and results to draw generally appropriate conclusions.						
	C Demonstrate general but incomplete grasp of the subject matter covered. Show adequate evidence of analytical and critical 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 purpose Demonstrates adequate skills in designing, producing and evaluating solutions of sound quality for specific for purposes. Use lab 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 some evidence of coherent and logical thinking of the changes that take place in variety of food during preparation, processing and storage. Identifies and uses basic techniques and equipment for a variety of food-specific purposes. Demonstrates basic skills in designing, producing and evaluating solutions for specific food purposes. 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 lack of coherent and logical thinking of he changes that take place in variety of food during preparation, processing and storage. Identifies with guidance factors and uses some appropriate techniques and equipment for a limited range of food-specific purposes. With guidance, demonstrates limited skills in designing, producing and evaluating solutions for specific food purposes. Use lab skills and techniques and analysis of data and results ineffectively, leading generally to inappropriate and usually erroneous conclusions.					
Course Type	Lecture with lab	poratory component course				
Course Teaching	Activities		Details	3	No. of Hours	
& Learning Activities	Lectures				24	
	Laboratory		laborat	ory/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	
	Examination			70	CLO 1,2,3	
	Laboratory rep	ports		30	CLO 1,2,3	
Required/recommended reading and online materials	Food Processing Technology-Principles & Practice 3rd Ed P.J. Fellows Unit Operations in Food Processing - 2nd ed. R.L. Earle					
Course Website	http://moodle.h	ku.hk/				
Additional Course Information	This course will be offered subject to a minimum enrollment number and availability of teachers.					

BIOL4207 Meat and dairy	sciences (6	creaits)	Academic Year	2015			
Offering Department	Biological	Biological Sciences Quota					
Course Co-ordinator	Prof N P S	Prof N P Shah, Biological Sciences (npshah@hku.hk)					
Teachers Involved		Prof N P Shah, Biological Science Dr J C Y Lee, Biological Sciences					
Course Objectives		To give students a broad understanding of modern practice and technologies used in meat and dain production, processing and marketing.					
Course Contents & Topics	slaughter emphasizi	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. Meat and dairy product marketing.					
Course Learning Outcomes	On succes	ssful completion of this course, students should be able to:					
	CLO 1 u	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 d	CLO 3 demonstrate knowledge of selected issues related to meat and dairy safety					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BI	Pass in BIOL3201 Food chemistry					
Offer in 2015 - 2016	Y 2nd	Y 2nd sem Examination May					
Offer in 2016 - 2017	Υ	Y					
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough grasp of the subject matter covered. Show strong analytical and critical abilities and logica 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.					
			presentational skills.				
	В		evidence of analytical and al-level problem solving. propriate conclusions to r	Use lab skills ar			
	В	problems. Demonstrate highly effective team-based organizational and Demonstrate substantial grasp of the subject matter covered. Show or logical thinking with some evidence of competence in professionate techniques and analysis of data and results to draw generally approximately a	evidence of analytical and al-level problem solving. oropriate conclusions to r kills. vered. Show some eviden sional-level problem solving priate but sometimes erron	Use lab skills ar eal-world problem ce of analytical ar g. Use lab skills ar eous conclusions			

	conclusions to real-world problems. Demonstrate team-based organizational and presentational skills of limited effectiveness.					
	coherent	Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered coherent and logical thinking, and minimal competence in professional-level problem solving. Use techniques and analysis of data and results ineffectively, leading generally to inappropriate and usu conclusions to real-world problems. Demonstrate ineffectiveness team-based organizational and preserved.				
Course Type	Lecture with laboratory component course					
Course Teaching & Learning Activities	Activities			3	No. of Hours	
	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	on		80	CLO 1,2,3	
	Laboratory reports	oratory reports		20	CLO 1,2	
Required/recommended reading and online materials		nce. RA Lawrie (CRC Press, nd Quality Assurance. RC Ch		A Kilara, N Shah (Eds) (Blackwell, 2008)	
Course Website	http://moodle.hku.hk/					
Additional Course Information	This course will be offered subject to a minimum enrollment number and availability of teachers.					

BIOL4209 Functional foods	s (6 credi	ts)	Academic Year	2015			
Offering Department	Biologica	al Sciences	Quota	40			
Course Co-ordinator	Dr M F V	Dr M F Wang, Biological Sciences (mfwang@hku.hk)					
Teachers Involved	Dr M F V	Dr M F Wang, Biological Sciences					
Course Objectives	To provide a fundamental understanding of the rapidly emerging functional food/nutraceutical industry with an emphasis on the history, regulation, chemical basis and quality control of healthy ingredients/product and their effects on human health.						
Course Contents & Topics	Concept, history and global regulation of functional foods and nutraceuticals; classification of functional foods and nutraceuticals based on their chemical structures; unsaturated fatty acids, proteins, food pigments and dietary fibers 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 Outcomes	On succ	essful completion of this course, students should be	able to:				
	CLO 1	understand the definition and global regulation of fu	inctional foods and nutraceutic	als			
	CLO 2	have substantial chemical knowledge of functional	food and nutraceutical product	S			
	CLO 3	be able to describe examples of functional food benefits	e able to describe examples of functional foods and interpret critically their claimed health enefits				
	CLO 4	demonstrate understanding of the current functional food and nutraceutical industry					
	CLO 5 understand major techniques and technologies for quality control and manufacturing of healthy products						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIOL3201 Food chemistry or BIOL3202 Nutritional biochemistry						
Offer in 2015 - 2016	Y 1s	Y 1st sem Examination Dec					
Offer in 2016 - 2017	Υ	Y					
Course Grade	A+ to F	A+ to F					
Grade Descriptors	A	Demonstrate thorough grasp of the subject matter covered. Show strong analytical and critical abilities and logic thinking, with evidence of creative ability and competence in professional-level problem solving. Critically used to draw appropriate and insightful conclusions to real-world problems. Demonstrate highly effective tead 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 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 ar critical abilities and logical thinking with limited competence in professional-level problem solving. Use knowledge draw moderately appropriate but sometimes erroneous conclusions to real-world problems. Demonstrate moderate effective team-based organizational and presentational skills.					
	D	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.					
		Demonstrate little or no grasp, with retention of little relevant information, of the subject matter covered. Show lack or coherent and logical thinking, and minimal competence in professional-level problem solving. Use knowledge					

			to inappropriate and usually erroneous con- based organizational and presentational skills.	clusions to real-world problems.					
Course Type	Lecture-based c	ecture-based course							
Course Teaching & Learning Activities	Activities		Details	No. of Hours					
a Learning Activities	Lectures			36					
	Tutorials		tutorials/seminars	12					
	Reading / Self s	study		100					
Assessment Methods and Weighting	Methods Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping					
	Assignments		30	CLO 1,2,3,4,5					
	Examination		70	CLO 1,2,3,4,5					
Required/recommended reading and online materials			uticals and Functional Foods (CRC Pre foods and Nutraceuticals: a Global Per						
Course Website	http://moodle.hk	u.hk/							
Additional Course Information	This course will	be offered subject to a n	ninimum enrollment number and availa	bility of teachers.					

BIOL4210 Food product de	evelopme	nt (6 credits)	Academic Year	2015						
Offering Department	Biologica	al Sciences	Quota	40						
Course Co-ordinator	Dr M F V	Vang, Biological Sciences (mfwang@hku.h	k)	·						
Teachers Involved	Dr M F V	M F Wang, Biological Sciences								
Course Objectives		introduce the key concepts and techniques used in food product development. To provide small group perience in the design, development and production of a new food product.								
Course Contents & Topics	prototyp	tory and future of the food industry; industrial product development process; idea generation ar totype development for new food products; quality management and legal protection; marketin tegies; food labeling; food package design; new product development for different food industries.								
Course Learning Outcomes	On succ	essful completion of this course, students s	hould be able to:							
	CLO 1	understand the food product development	cycle							
	CLO 2	know the key steps in new product develop	oment							
	CLO 3	demonstrate enhanced insight and unders	tanding of current and future trends i	n the food industry						
	CLO 4	have professional level practical experienc	e in new product development							
	CLO 5	know the main characteristics of different s	sectors of the food industry							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	ss in BIOL3203 Food microbiology or BIOL4205 Food processing and engineering								
Offer in 2015 - 2016	Y 19	t sem	Examination	No Exam						
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	A	Demonstrate thorough grasp of the subject matter covered. Show strong analytical and critical abilities a thinking, with evidence of creative ability and competence in professional-level problem solving. Critical skills and techniques and analysis of data and results to draw appropriate and insightful conclusions to problems. Demonstrate highly effective team-based organizational and presentational skills.								
	В	B Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and cr logical thinking with some evidence of competence in professional-level problem solving. Us techniques and analysis of data and results to draw generally appropriate conclusions to rea Demonstrate effective team-based organizational and presentational skills.								
	С	Demonstrate general but incomplete grasp of the subject matter covered. Show some evidence of a critical abilities and logical thinking with limited competence in professional-level problem solving. Use techniques and analysis of data and results to draw moderately appropriate but sometimes erroneous c real-world problems. Demonstrate moderately effective team-based organizational and presentational sk								
	D	D Demonstrate partial but limited grasp, with retention of some relevant information, of the sub Show some evidence of coherent and logical thinking, but lacking competence in professional-le Use lab skills and techniques and analysis of data and results to draw sometimes appropriate conclusions to real-world problems. Demonstrate team-based organizational and presentation effectiveness.								
	Fail	Fail Demonstrate little or no grasp, with retention of little relevant information, of the subject matter coherent and logical thinking, and minimal competence in professional-level problem solving techniques and analysis of data and results ineffectively, leading generally to inappropriate a conclusions to real-world problems. Demonstrate ineffectiveness team-based organizational and								
Course Type	Laborato	ry and workshop course								
Course Teaching	Activiti	es [Details	No. of Hours						
& Learning Activities	Laborat	ory		48						
	Group v	vork 8	30-100 hours group project work	100						

	Reading / Self study			100	
Assessment Methods and Weighting	Methods Details assessment of group product development project including inclass presentation		Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
				CLO 1,2,3,4,5	
	Test		20	CLO 1,2,3,4,5	
Required/recommended reading and online materials	E. Graf and I. S.	J. B. Lord: Developing New Food Pro Saguy: Food Product Development (v Food Product Development (CRC I	(Avi Books, 1991)	rketplace (CRC Press, 2007)	
Course Website	http://moodle.hku	ı.hk/			
Additional Course Information	This course will b	oe offered subject to a minimum enro	Ilment number and availa	bility of teachers.	

BIOL4301 Fish and fisherie	es (6 cred	lits)	Academic Year	2015							
Offering Department	Biologic	iological Sciences Quota									
Course Co-ordinator	Prof Y J	Prof Y J Sadovy, Biological Sciences (<i>yjsadovy</i> @ <i>hku.hk</i>)									
Teachers Involved	Prof Y J	Prof Y J Sadovy, Biological Sciences									
Course Objectives	and abid interaction to prove to fisher species. to cov	to acquaint students with the principles governing interrelationships among fishes as well as with bind abiotic aspects of their environment for an understanding of population dynamics and multispeteractions. To provide an understanding of how species diversity and selected aspects of their life history are relevation fishery management challenges, sustainable supply of seafood, and the conservation of threate becies. To cover the theoretical and practical aspects of marine fisheries management, fish farming and conservation using local, regional and global examples									
Course Contents & Topics	interaction the work and glob capture	ntroduction to course: phylogenetic, biological and ecological concepts and adaptation. Multispect nteractions in marine and freshwater fish assemblages. Fishery theory; how do fisheries work? Status he world's capture fisheries; fish stock assessment and fishery management practices using local, region and global examples. The roles of mariculture and capture fisheries for seafood supply and relationship capture fisheries. Fishery management and fish conservation. Conclusion: fish biodiversity and fish production; ethics of fish research and exploitation; climate change and the future of fish and fisheries.									
Course Learning Outcomes	On succ	essful completion of this course, students should be able to	:								
	CLO 1	CLO 1 understand the basis of fish species diversity in relation to phylogenetic, ecological and biologic 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										
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	BIOL3301 Marine biology or BIOL3303 Conservation ecolog	ЭУ								
Offer in 2015 - 2016	Y 21	nd sem	Examination	May							
Offer in 2016 - 2017	Υ		'								
Course Grade	A+ to F										
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining a course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of origins thought, ability to integrate and synthesize information, and ability to apply knowledge to a wide range of complex familiar and unfamiliar situations. Apply highly effective presentational skills. Strong evidence of clear attention thoughful and reflective thinking.									
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most or course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, integration materials and ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate effer presentational skills. Evidence of clear attention to thoughtful and reflective thinking.										
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the cours learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to app knowledge to most familiar situations. Apply moderately effective presentational skills. Little evidence of clear attention to thoughful and reflective thinking.										
	D	Demonstrate partial but limited command of knowledge and skills re outcomes. Show evidence of some coherent and logical thinking, bi little attempt at integration. Show limited ability to apply knowledge presentational skills. Lack of attention to thoughtful and reflective thin	ut with limited analytical an to solve problems. Apply lir	d critical abilities an							
	Fail	Demonstrate little or no evidence of command of knowledge and outcomes. Lack of analytical and critical abilities, logical and cohere knowledge to solve problems. Organization and presentational skills	nt thinking. Show very little	or no ability to appl							
		knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.									

Course Teaching	Activities		Det	ails		No. of Hours
& Learning Activities	Lectures					24
Assessment Methods and Weighting	Field work		Field, laboratory, practical and tutorials		and	36
	Reading / Self s	tudy				100
	Methods	Details	Weighting in final course grade (%)		As	Assessment Methods to CLO Mapping
	Assignments			30	CI	LO 1,2,3,4,5
	Examination			60	CI	LO 1,2,3,4,5
	Test			10		CLO 3
Required/recommended reading and online materials	Science Ltd, 200	eynolds J. D. (eds): Handbook 12) Collette and D. Facey: The Div		67		
Course Website	http://www.biosc	h.hku.hk/ecology/lsc/				
Additional Course Information	This course will b	pe offered subject to a minimu	ım enrol	lment number and availab	oility of	teachers.

BIOL4302 Environmental i	mpact ass	sessment (6 credits)		Academic Year	2015					
Offering Department	Biologica	Biological Sciences Quota 30								
Course Co-ordinator	Dr D M B	Or D M Baker, Biological Sciences (dmbaker@hku.hk)								
Teachers Involved	Prof K M	Or D M Baker, Biological Sciences Prof K M Y Leung, Biological Sciences Or C H Hau, Biological Sceinces								
Course Objectives		o introduce the general principles, processes, techniques, current practices and problems convironmental impact assessment (EIA).								
Course Contents & Topics	legislation remediati audit. Co modeling	Background and history of EIA development. Concept of carrying capacity and precautionary principle. E egislation. Processes in conducting EIA. Risk assessment and management. Mitigatory measures and emediation. Cost benefit analysis. Socio-economic perspectives and analysis. Project monitoring and audit. Common techniques employed in EIA (e.g. matrix, sequence diagram, causal chain analys modeling). Modern EIA instruments (environmental liability, environmental insurance and environment share). Application of EIA in environmental management. Case studies. Role play exercise.								
Course Learning Outcomes	On succe	ssful completion of this course, stud	lents should be able to:							
	CLO 1	CLO 1 understand the operation of EIA systems in Hong Kong and overseas								
	CLO 2	apply a variety of techniques in asse	essing environmental imp	act						
	CLO 3	evaluate different options and deter	ronmental impact as	onmental impact assessment						
	CLO 4	CLO 4 prepare EIA reports for small scale projects								
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in BIOL2103 Biological sciences laboratory course or BIOL2306 Ecology and evolution; and Any BIOL3XXX course or ENVS3004 Environment, society and economics								
Offer in 2015 - 2016	Y 2n	d sem		Examination	May					
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of origina thought, ability to integrate and synthesize information, and ability to apply knowledge to a wide range of complex familiar and unfamiliar situations. Apply highly effective presentational skills. Strong evidence of clear attention to thoughtful and reflective thinking.								
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, integration material sand ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate effect presentational skills. Evidence of clear attention to thoughtful and reflective thinking.								
	С									
	D	Demonstrate partial but limited comman outcomes. Show evidence of some cohe little attempt at integration. Show limited presentational skills. Lack of attention to	erent and logical thinking, but v ability to apply knowledge to s	vith limited analytical and olve problems. Apply limited	critical abilities and					
	Fail	Fail Demonstrate little or no evidence of outcomes. Lack of analytical and critical knowledge to solve problems. Organizati	abilities, logical and coherent t	hinking. Show very little of	or no ability to apply					
Course Type	Lecture w	rith laboratory component course								
Course Teaching	Activitie	es	Details		No. of Hours					
& Learning Activities	Lectures				24					
	Field wo	ul.	field trip / tutorials		24					

	Reading / Self study		student center learning		70	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Metho to CLO Mappi		
	Assignments		50	CLO 1,2,3,4		
	Examination		50	CLO 1,2,3,4		
Required/recommended reading and online materials	Routledge, 2005 HKSAR Governi Kong: HKSAR G)	vick: Introduction to Environmental I	7 (
Course Website	http://www.bioscl	h.hku.hk/ecology/lsc				
Additional Course Information	The course will b	e offered subject to a r	minimum enrollment number and avai	lability of teachers.		

BIOL4303 Animal behavior	ur (6 cred	ts)		Academic Year	2015							
Offering Department	Biologic	Sciences		Quota	30							
Course Co-ordinator	Dr L Kaı	Dr L Karczmarski, Biological Sciences (leszek@hku.hk)										
Teachers Involved	Dr L Kaı	r L Karczmarski, Biological Sciences										
Course Objectives	provides mechan their phy choose	his course teaches students the ways and means of exploring and understanding animal behaviour; rovides insights into a field of science that investigates everything animals do, including the underlying techanisms and functions of specific behaviours; the ways in which animals interact with each other, we leir physical environment and other organisms; how animals find and defend resources, avoid predator noose mates, reproduce, and care for their young; how complex animal societies are formed and he ehaviour of an individual affects the structure of a population.										
Course Contents & Topics Course Learning Outcomes	animal the mechan serve? If organism groups, instance emphas small groups and the behavio will discount that replated illu ecology	se will introduce students to sehaviour and behavioural ecoloms? How does behaviour de prexample; why are some specthe hunter and another the hocial life is among the most of the birth of sterile castes, likes the reproductive success oups like squirrels, would an indicate and ecological and evolutional rall ecology and understand the ses several classical studies that is sents the current concepts white the links between the revith their application in animal cossful completion of this course.	rgy. What causes specific belivelop within the individual's cies monogamous while others unted? Several animal species complex and effective surviva e in bees, be explained through the fas many individuals as possividual risk its own life to save by principles, students will lead causes, functions, development form the foundation of this fietch have led to modern underscent extraordinary advances conservation.	naviour and what are lifetime and what fu is are polygamous? Wes, including humans il strategy. However, bugh an evolving me sible? Why, among a the rest of the group? arn to think within the lent, and evolution of eld, as well as more standing of animal bel	e the underlyin- inctions does //hat makes on , tend to live i how could, fo echanism which animals living i ? In this course ne paradigm of behaviour. W recent researc haviour. We wi							
Course Learning Outcomes	On successful completion of this course, students should be able to:											
	CLO 1 learn to appreciate the causes, functions, development, and evolution of animal behaviour											
	CLO 2 appreciate the complexity of interactions between environmental selective pressures 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 in terms of behavioural ecology, animal socio-behavioural complexity, and how the understanding of species' behaviour contributes to its conservation											
Pre-requisites (and Co-requisites and Impermissible combinations)	BIOL330	IOL2306 Ecology and evolutior I Marine biology or BIOL3313 gy of marine mammals			gy or BIOL332							
Offer in 2015 - 2016	N			Examination								
Offer in 2016 - 2017	Υ											
Course Grade	A+ to F											
Grade Descriptors	A	Evidence of a thorough grasp of the subject in a broader comparative perspective as demonstrated by background reading and 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 general command of acquired knowledge to draw meaningful and logical conclusions. Work more than sufficient for what is required at degree level.											
	С	and limited use of named exampl and/or independent; only partial a conclusions. Fair presentation ski		of logical critical thinking and work independently to	, but not insightful o draw meaningful							
	D			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.							
	no f	No evidence of basic minimum knowledge and understanding of the subject. No evidence of background read no familiarity with any relevant examples and case studies. Inadequate evidence of coherent logical t ineffective presentation skills with poor argumentation and no abilities to draw meaningful conclusions. Work reach degree level.						
Course Type	Lecture with labor	oratory component course						
Course Teaching & Learning Activities	Activities		De	tails		No. of Hours		
a Leaning Activities	Lectures					24		
	Laboratory			luding field trips, site veractive practical/ssions, classroom debates	visual	32		
	Project work			ject work review		8		
	Reading / Self study					60		
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	Ass	sessment Methods to CLO Mapping		
	Assignments	active participation/continu assessment/presentation	nuous 55		CL	CLO 1,2,3,4,5		
	Examination		45		CL	O 1,2,3,4,5		
Required/recommended reading and online materials	Publishing 2005 Danchin E., Gira Dugatkin L.A. P	Siraldeau L.A. The Behavior of A) Ideau L-A. & Cezilly F. Behaviou rinciples of Animal Behavior (2nd oore J. (eds). Encyclopedia of Ar	ıral E edit	Ecology (Oxford University ion) (W.W. Norton & Com	Press 2	2008) 2009)		
Course Website	http://www.biosc	h.hku.hk/ecology/lsc						
Additional Course Information		fered in alternate year. be offered subject to a minimum e	enrol	Ilment number and availat	oility of t	eachers.		

BIOL4401 Medical microbio	ology an	d applied immunology (6 credits)	Academic Year	2015						
Offering Department	Biologic	al Sciences	Quota	40						
Course Co-ordinator	Dr W Y	Dr W Y Lui, Biological Sciences (wylui@hku.hk)								
Teachers Involved	Prof W	Dr W Y Lui, Biological Sciences Prof W W M Lee, Biological Sciences Dr A Yan, Biological Sciences								
Course Objectives		The objective is to provide students the knowledge on the practical applications of immunology a nicrobiology in biological research, clinical analysis and disease diagnosis.								
Course Contents & Topics	Applicat immuno Principle Techniq Microbia resistan	Basic parameters affecting antigen-antibody interactions Application of antigen-antibody interaction in advanced research: CHIP assay, co-immunoprecip immunohistochemistry and dual Immunofluorescence Principles and application of flow cytometry Techniques in cellular immunology and tumor immunology Microbial pathogens and associated diseases, host immune response, antimicrobial agents and me resistance, epidemiology and prevention of microbial infections Clinical laboratory analyses in serology, haematology, blood banking, microbiology and chemical pat								
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									
	CLO 3 understand the scientific principles of various clinical laboratory analyses									
	CLO 4	CLO 4 promote public attention on control of microbial infection and the spread of antibiotic resistance								
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	BIOL3401 Molecular biology or BIOL3403 Immunology								
Offer in 2015 - 2016	Y 2	nd sem	Examination	May						
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	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.									

		outcomes. S to most fan	te general but incomplete comm Show evidence of some analytical niliar situations. Apply moderately and results to draw appropriate of	and critical effective Is	al abilities and logical thinking ab skills and techniques. Mos	, and ability to apply knowledge stly correct but some erroneous		
		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 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 with	ecture with laboratory component course						
Course Teaching & Learning Activities	Activities			Details		No. of Hours		
	Lectures					24		
	Laboratory					20		
	Tutorials					6		
	Reading / S	elf study				100		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examination	ı			70	CLO 1,2,3		
	Laboratory reports			30		CLO 1,2,3		
Required/recommended reading and online materials	To be annou	nced in c	lass					
Course Website	http://moodle	e.hku.hk/						
Additional Course Information	This course	will be off	ered subject to a minimum	enrollme	nt number and availabil	ity of teachers.		

BIOL4402 Microbial biotec	hnology	(6 credits)	Academic Year	2015						
Offering Department	Biologic	al Sciences	Quota	30						
Course Co-ordinator	Dr J S F	Dr J S H Tsang, Biological Sciences (jshtsang@hku.hk)								
Teachers Involved	Dr J S F	r J S H Tsang, Biological Sciences								
Course Objectives	biotechr algae.	is course is intended for students who would like to understand the application of modern microbiology in technology. The microbial systems being used include different types of viruses, bacteria, fungi and pae. At the end of the course the students are expected to know the parameters and conditions that ect the yield of production and the systems available for the expression of vaious types of biotechnology adducts.								
Course Contents & Topics	for micr yeasts a include	pstream and downstream processing will be briefly described to equip the students with the backgroup microbial biotechnology. The latest advances in microbial expression systems using viruses, bacte easts and algae will be reviewed. Specific examples on the use of these systems will be provided. The clude but not limited to production of recombinant vaccines, secondary metabolites, food and for diditives, industrial enzymes and biopesticides as well as bioremediation and medical diagnostics.								
Course Learning Outcomes	On successful completion of this course, students should be able to:									
	CLO 1	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 biotechnology									
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	BIOL3401 Molecular biology								
Offer in 2015 - 2016	Y 2	nd sem	Examination	May						
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive course learning outcomes. Demonstrate deep understanding of the of appropriate theories, principles, evidence and techniques. Illustrate of information drawn from a full range of high quality sources an organizational and presentational skills.	e subject. Demonstrate integra ate insightful use and critical a	tion of the full range analysis / evaluatior						
	В	Demonstrate substantial command of a broad range of knowledge learning outcomes. Demonstrate substantial grasp of the subjection principles, evidence and techniques. Illustrate critical use of relevances.	ct. Demonstrate general inte	gration of theories						

Course Website	http://mood	dle.hku.	hk/				
Required/recommended reading and online materials	Freeman 8	& Co., 1	995)		ology: Fundamentals of A c. L. Hershberger, W-S. Hu,	pplied Microbiology (W. H. D.	
	Examinat	ion			70	CLO 1,2,3	
	Assignme	ents			30	CLO 1,2,3,4	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Reading /	Self stu	udy			100	
	Tutorials	Tutorials		ir	cluding group presentation	s 18	
a Learning Activities	Lectures	Lectures				30	
Course Teaching & Learning Activities	Activities		D	etails	No. of Hours		
Course Type	Lecture-ba	ased cou	urse				
	Fail Demonstrate little or no knowledge and skills required for attaining the course I evidence of little or no grasp of the knowledge and understanding of the subject. Sh of theories, principles, evidence and techniques. Show limited use of secondary so of them. Organization and presentational skills are minimally effective or ineffective.					how little or no or inapt integration ources and no critical comparison	
	D	Demonstrate limited 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. Show limited integration of theories, principles, evidence and techniques. Demonstrate use and reference of several sources, but mainly through summary rather than analysis and comparison. Apply limited or barely effective organizational and presentational skills.					
	С	outcom theorie make	nes. Demonstrate general es, principles, evidence and	but incomplete techniques. Ille erent interpret	e grasp of the subject. Demons ustrate use of relevant information	ng most of the course learning strate some partial integration of n from sources, showing ability to sptly. Apply moderately effective	
			meaningful comparisons by e organizational and presen		nt secondary interpretations and	to quote/reference aptly. Apply	

BIOL4409 General virolog	y (6 credi	ts)	Academic Year	2015			
Offering Department	Biologic	al Sciences	Quota	30			
Course Co-ordinator	Dr W B	L Lim, Biological Sciences (bllim@hku.hk)					
Teachers Involved		L Lim, Biological Sciences C Leung, Biological Sciences					
Course Objectives	This Course provides the fundamental principles of virology so that students can understand pathogenesis of major viral diseases that affect animal health. The course will prepare students profession or graduate work in virology, medicine and biotechnology.						
Course Contents & Topics	1. Class 2. Virus 3. Virus 4. Virus 5. Virus 6. RNA 7. Baltir 8. Baltir 9. Ambi 10, 11. 12. Balt 13, 14. 15. Balt 16. Mec 17. Anti 18. Viru Practica 19. Spe Quality 20. Viru 21, 22. Comple	structure: Capsid symmetry, Icosahedral symmetry structure: Capsid symmetry, Icosahedral symmetry structure: Genetic Materials, Nucleocapsid, Envelope entry: Receptors, uncoating and fusion cell interaction viruses: Genome replication and mRNA production more Class IV (+) s.s. RNA viruses: Picornaviruses nore Class IV (-) s.s. RNA viruses: Myxoviruses sense RNA viruses: Bunyaviruses and Arenaviruses Baltimore Class VI (+) s.s. RNA viruses: Retroviruses more Class III d.s. RNA viruses: Reoviruses Baltimore Class I d.s. DNA viruses: Adenoviruses, Herpe imore Class II s.s. (+) DNA viruses: Parvoviruses hanisms of Viral Oncogenesis eviral treatments ses as Tools in Medicine and Biotechnology Il Virology cimen Collection, Transportation and Processing, Assurance & Laboratory Safety sisolation, propagation and titration virus Identification: Immunocytochemical assays, ELISA, ment Fixation Assay, Hemagglutination and HI assays Neutralization assay and Antiviral assay					
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1	be familiar with virus classification and the modes of refamilies	eplication and transmissio	n of various viral			
	CLO 2	CLO 2 gain hand-on experiences on common virological techniques					
	CLO 3 carry out researches on virology after taking this course						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	BIOL3401 Molecular biology or BIOL3403 Immunology					

Offer in 2015 - 2016	Y 1st	sem			Examinat	tion	Dec
Offer in 2016 - 2017	Υ				·		
Course Grade	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of knowledge required for attaining all the course learning outcomes. Show strong analytical skills and competent ability to acquire knowledge on new development of the subject. Apply highly effective lab skills and techniques. 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 skills and adequate ability to acquire knowledge on new development of the subject. Apply effective lab skills and techniques. 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 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						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical skills and ability to acquire knowledge on new development of the subject. Apply minimally effective or ineffective lab skills and techniques. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture w	vith laborator	ry component course				
Course Teaching	Lecture w			Details			No. of Hours
···		es		Details			
Course Teaching	Activitie	es :		Details			24
Course Teaching	Activitie Lectures	es ory		Details			24
Course Teaching	Activitie Lectures Laborato Tutorials	es ory		Details			24 24 6
Course Teaching	Activitie Lectures Laborato Tutorials	ory / Self study		Details	Weighting in final course grade (%)		24 24 6 100 sment Methods
Course Teaching & Learning Activities Assessment Methods	Activitie Lectures Laborato Tutorials Reading	ory / Self study	ry component course	Details		t	24 24 6 100 sment Methods
Course Teaching & Learning Activities Assessment Methods	Activitie Lectures Laborato Tutorials Reading Methods Examina	ory / Self study	ry component course	Details	course grade (%)	t C	24 24 6 100 sment Methods o CLO Mapping
Course Teaching & Learning Activities Assessment Methods	Activitie Lectures Laborato Tutorials Reading Methods Examina Laborato Virology: Principles	y Self study	ry component course	s (2010) L. C. Press.	course grade (%) 80 20	t C	24 24 6 100 sment Methods o CLO Mapping
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading	Activitie Lectures Laborato Tutorials Reading Methods Examina Laborato Virology: Principles Basic Viro	y Self study	Details Details iology and pathogenesis (2009) S.J. Flint, ASM F	s (2010) L. C. Press.	course grade (%) 80 20	t C	24 6 100 sment Methods o CLO Mapping LO 1,2,3

BIOL4411 Plant and food	biotechnology (6 credits)	Academic Year	2015				
Offering Department	Biological Sciences	Quota	80				
Course Co-ordinator	Prof M L Chye, Biological Sciences (mlchye@hku.hk)						
Teachers Involved	Prof M L Chye, Biological Sciences						
Course Objectives	This course covers the principles and key concepts of plant and food biotechnology and its applications increasing global food supply. The significances of biotechnology in agriculture and food production, are the emerging importance of plant biotechnology in molecular farming for the production biopharmaceuticals and other high-value proteins will be discussed. The course will also provide an insign 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 geto a techniques in plant gene transfer: Agrobacterium-mediated. Nuclear and plastid transformation. Gene silencing in plants. Genetic manipulation of commercit Extending shelf-life of fruits. Prevention of enzymatic brown Genetically-engineered biofortified foods: provitamin A-enanthocyanin tomatoes. Biotechnology in plant pest and disease management: Producing crops resistant to phytopathogens and pests. Short-interfering RNAs in gene silencing to defend against perotecting crops in the field using the Bt toxin. Pest-resistant genetically-transformed seeds using the alphate. Herbicide-resistant crops. Plants as bioreactors for molecular farming: transgenific recombinant biopharmaceutical proteins. Biodegradable plastics. Biofuels. Genetically-modified crops and food products: regulation, testatus of GM food in North America, Europe and Hong Kongered. Regulations on the production of plant-derived pharmaceutical. 	transformation, biolistics and ially useful biosynthetic pathwhing of potato tubers. riched rice, omega-3-enriched lant viruses. a-amylase inhibitor ic and transplastomic plant sting and labelling.	vays in crops. ed soy and high-				
Course Learning Outcomes	On successful completion of this course, students should be a	able to:					

		acquire key biotechnolog	concepts in plant and foo	d biotechno	ology and basic labor	atory techniques in plant	
	CLO 2	gain insight i	nto real-life applications in	plant and fo	ood biotechnology		
	CLO 3	develop scie	ntific inquiry and critical thi	nking skills			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	ass in BIOL3401 Molecular biology or BIOL3211 Nutrigenomics					
Offer in 2015 - 2016	Y 1s	t sem			Examina	tion Dec	
Offer in 2016 - 2017	Υ	Y					
Course Grade	A+ to F	+ to F					
Grade Descriptors	A	Demonstrate thorough and complete mastery of extensive knowledge and skills required for attaining the learni outcomes in Plant and Food Biotechnology. Show strong analytical and critical abilities and logical thinking, we vidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamil situations in plant biotechnology. Apply highly effective organizational and presentational skills.					
	В				evidence of analytical a	and critical abilities and logical	
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining learning outcomes. Show evidence of some analytical and critical abilities and logical thinkin knowledge to most familiar situations. Show moderately effective organizational and presentati			cal thinking, and ability to apply		
	outcomes. Some evidence of c		Some evidence of coherent and ed ability to apply knowledge in	imited command of knowledge and skills required for attaining some of the course learning se of coherent and logical thinking, accompanied with limited analytical and critical skills oply knowledge in plant biotechnology. Show limited or barely effective organizational and			
	Fail	analytical a	onstrate command of knowledge and critical abilities, logical and gy. Ineffective organizational and	coherent think	king. No evidence in abili		
Course Type	Lecture v	with laborator	y component course				
Course Teaching	Activitie	es		Details		No. of Hours	
& Learning Activities	Lectures					24	
	Laborate	ory		practical/	30		
	Reading / Self study					100	
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examina	ation			70	CLO 1,2,3	
	Laborate	ory reports			10	CLO 1,2,3	
	Presenta	ation			20	CLO 1,2,3	
Required/recommended reading and online materials	E-reserve	els, M.J. and I es (HKU Libra notes on Moo		s, and agric	ulture. Jones and Bar	tlett.	
Course Website	http://mo	odle.hku.hk/					
Additional Course Information	An advar	nced elective	logy & Biotechnology Majo course in FNS Major course in Plant Science M				

BIOL4415 Healthcare biote	chnolog	y (6 credits)	Academic Year	2015			
Offering Department	Biologic	al Sciences	Quota 70				
Course Co-ordinator	Prof A S	T Wong, Biological Sciences (awong1@hku.hk)					
Teachers Involved		Prof A S T Wong, Biological Sciences Dr K W Y Yuen, Biological Sciences					
Course Objectives		urse discusses the key concepts and principles involve ions in molecular medicine.	ed in healthcare biotechi	nology, and their			
Course Contents & Topics	animals antibioti Advanc diagnos technolo An over drug ta	biotechnology in animals (transgenics, knockouts and as models in the study of human diseases, as biordes and vaccines and organs for xenotransplantation. Bed molecular biology techniques related to human and is and development of new therapies. These include to be significant or the drug development process, with a focus on the transplantation, high-throughput assay development is and natural products). The concept of individualized metals as well as the state of the	eactors for the production in animal science basic results to the but not limited to: appengineering. The early-stage, preclinicant, and screening of control of the carty-stage.	on of hormones, esearch, disease dications of DNA al drug discovery, themical libraries			
Course Learning Outcomes	On succ	essful completion of this course, students should be able	to:				
	CLO 1	describe key concepts in genetic biotechnology and hum	nan health				
	CLO 2	acquire and apply advanced laboratory techniques esser	ntial to biotechnology				

	CLO 3 develop scientific inquiry and critical thinking skills to understand, analyze, and evaluate problems in order to develop solutions							
	CLO 4 gain insight into real-world applications in healthcare biotechnology							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in BIC	Pass in BIOL3401 Molecular biology						
Offer in 2015 - 2016	Y 2nd	sem			Examinatio	n May		
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge required for attaining all learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of originand ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply high organizational skills. Writings consistently demonstrate informed, thoughtful intellectual engagement with the of relevant concepts.						
	В	·						
	С							
	D	D Demonstrate partial but limited command of knowledge required for attaining some of the course learni Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. ability to apply knowledge to solve problems. Apply limited or barely effective organizational skills. Wr some intellectual engagement with concepts or theories but mostly at a superficial level.				critical abilities. Show limited		
	Fail	Lack of and to solve p	te little or no evidence of comma alytical and critical abilities, logical problems. Organizational skills a engagement with concepts or the	and coherent thinking. Sho re minimally effective or in	w very little or r neffective. Writ	no ability to apply knowledge		
Course Type	Lecture wit	th laborator	ry component course					
Course Teaching	Activities			Details		No. of Hours		
& Learning Activities								
	Lectures					24		
	Lectures	у				24		
		у		tutorials/assignments	s/computer			
	Laboratory	y Self study			s/computer	24		
Assessment Methods and Weighting	Laboratory		Details		in final	24		
	Laboratory Tutorials Reading /	Self study		sessions	in final	24 6 100 Assessment Methods		
	Laboratory Tutorials Reading / Methods	Self study	Details	sessions	in final ade (%)	24 6 100 Assessment Methods to CLO Mapping		
	Laboratory Tutorials Reading / Methods Assignme	Self study	Details	sessions	in final ade (%)	24 6 100 Assessment Methods to CLO Mapping CLO 1,3,4		
	Laboratory Tutorials Reading / Methods Assignme Examination	Self study	Details	sessions Weighting	in final ade (%) 10 60	Assessment Methods to CLO Mapping CLO 1,3,4 CLO 1,3,4		
	Laboratory Tutorials Reading / Methods Assignme Examination Laboratory Test - Textbook 2002) - Human M	Self study ents ion y reports c of Drug [Details	Weighting course grange gsgaard-Larsen, Liljefo	in final ade (%) 10 60 20 10 ors, and Mac	24 6 100 Assessment Methods to CLO Mapping CLO 1,3,4 CLO 1,3,4 CLO 1,2,3,4 CLO 1,3		
and Weighting Required/recommended reading	Laboratory Tutorials Reading / Methods Assignme Examination Laboratory Test - Textbook 2002) - Human M	Self study ents ion y reports c of Drug [Molecular G d readings	Details Assignment/Discussion Design and Discovery (Krodenetics (Strachan and Read of or each topic will be provided)	Weighting course grange gsgaard-Larsen, Liljefo	in final ade (%) 10 60 20 10 ors, and Mac	24 6 100 Assessment Methods to CLO Mapping CLO 1,3,4 CLO 1,3,4 CLO 1,2,3,4 CLO 1,3		

BIOL4416 Stem cells and	regenerative biology (6 credits)	Academic Year	2015			
Offering Department	Biological Sciences	Quota	40			
Course Co-ordinator	Dr K W Y Yuen, Biological Sciences (kwyyuen@hku.hk)					
Teachers Involved	Dr K W Y Yuen, Biological Sciences Dr J Zhang, Biological Sciences					
Course Objectives	To introduce the current understanding in regenerative biology molecular level, and to present the interconnection between these		the cellular an			
Course Contents & Topics	The course will discuss cutting-edge research in (i) regenerative and stem cell biology: - the basic characteristics of stem cells - the molecular and genetic control of cell fate specification and d - embryonic and adult stem cells - experimental inducible pluripotent stem cells and tissue enginee - therapeutics potentials for stem cell technology - ethical issues in stem cell research (ii) aging and longevity: - model systems used for aging and life-span studies - cellular and molecular biology of aging - telomeres and cellular senescence					

	Reading / Self study						100	
	Tutorials						6	
	Laborato	ory					24	
J	Lectures	:					24	
Course Teaching & Learning Activities	Activitie	Activities Details				No. of Hours		
Course Type	Lecture w	ith laborator	ry component course					
	Fail	outcomes.	te little or no evidence of comm. Lack of analytical and critical abili to solve problems. Organization a	ities, logical	and coherent thinking.	. Show very lit	tle or no ability to apply	
	D	outcomes. limited abi presentatio	Evidence of some coherent and lity to apply knowledge to sol nal skills.	limited command of knowledge and skills required for attaining some of the course learning some coherent and logical thinking, but with limited analytical and critical abilities. Show knowledge to solve problems. Apply limited or barely effective organizational and evidence of command of knowledge and skills required for attaining the course learning				
	learning outcomes. Evidence of some a		utcomes. Evidence of some and to most familiar situations. Apply r	nmand of knowledge and skills required for attaining most of the cour analytical and critical abilities and logical thinking, and ability to apply moderately effective organizational and presentational skills.			g, and ability to apply tional skills.	
	В	course lea	te substantial command of a broad rning outcomes. Evidence of an to familiar and some unfamiliar sit	alytical and	critical abilities and	logical thinking	ig, and ability to apply	
Grade Descriptors	A	attaining a evidence of	te thorough and complete master Il the course learning outcomes. If original thought, and ability to Apply highly effective organization	Show stror apply know	ng analytical and critic rledge to a wide range	cal abilities ar	nd logical thinking, with	
Course Grade	A+ to F							
Offer in 2016 - 2017	Υ							
Offer in 2015 - 2016	Y 2nd	d sem			Exan	nination	May	
Pre-requisites (and Co-requisites and Impermissible combinations)	technolog	Pass in BIOL3211 Nutrigenomics or BIOL3401 Molecular biology or BIOL3402 Cell biology and contechnology or BIOL3403 Immunology or BIOL3404 Protein structure and function or BIOL3408 Genetics BIOC3601 Metabolism or BIOC3604 Essential techniques in biochemistry and molecular biology.						
	CLO 4	describe the	e cellular mechanisms of ac	ging, and t	the pathways invol	lved in long	evity	
	CLO 3	,						
	CLO 2 describe the characteristics of stem cells and the different types of stem cell					stem cells	ells	
	CLO 1 appreciate t		the complex regulations of	cell poten	cy, cell age and or	ganism lon	gevity	
Course Learning Outcomes	On succe	essiui compie	etion of this course, student	s snould i	be able to:			
	+ -		I and metabolic pathways in		· ,			

BIOL4417 'Omics' and s	Academic Year	2015					
Offering Department	Biological Sciences	Quota	40				
Course Co-ordinator	Dr J W Zhang, Biological Sciences (jzhang1@hku.hk)	Dr J W Zhang, Biological Sciences (jzhang1@hku.hk)					
Teachers Involved	Dr J W Zhang, Biological Sciences	Dr J W Zhang, Biological Sciences					
Course Objectives	Recent progress in high-throughput omics technology has revolutive wide profiling of various biomolecules simultaneously by omics data, providing the potential to obtain a global and holistic vier introduce the technologies of Omics and Systems Biology, and technology in agricultural, biomedical, environmental, and nutritical	technology generates he w of the system. This verview of various applic	uge amounts of course aims to cations of omics				

Demons learning knowled Demons outcome limited present Demons outcome knowled	strate general but incomplete command of key outcomes. Evidence of some analytical adge to most familiar situations. Apply moderate strate partial but limited command of knowledes. Evidence of some coherent and logical ability to apply knowledge to solve probational skills. Strate little or no evidence of command of kees. Lack of analytical and critical abilities, log dige to solve problems. Organization and presentatory component course Details Details	Apply effective organizational at knowledge and skills required and critical abilities and logic- ely effective organizational and dge and skills required for attain thinking, but with limited anal olems. Apply limited or bare knowledge and skills required ical and coherent thinking. Sho entational skills are minimally el	and presenta for attaining all thinking, presentation ning some o lytical and ci ely effective for attaining ow very little ffective or ine Asses t CLC	and ability to apply ational skills. I most of the course and ability to apply hal skills. If the course learning ritical abilities. Show organizational and the course learning or no ability to apply or no ability to apply
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Demons	strate general but incomplete command of kg outcomes. Evidence of some analytical a	Apply effective organizational and control and skills required and critical abilities and logic	and presenta for attaining al thinking,	and ability to apply ational skills. I most of the course and ability to appl
	dge to familiar and some unfamiliar situations.			and ability to appl
B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least mo course learning outcomes. Evidence of analytical and critical abilities and logical thinking, and ability knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.				
Demonstrate thorough and complete mastery at an advanced level of extensive knowledge and skills required attaining all the course learning outcomes. Show strong analytical and critical abilities and logical thinking, vevidence of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfami situations. Apoly highly effective organizational and presentational skills.				
nd sem		Examin	ation	May
ogy or BIOI	L3403 Immunology or BIOL3404 Pro	tein structure and function	on or BIOL	3408 Genetics
identify qu	uestions that can be addressed by 'C	Omics' and System Biolo	gy studies	s, appreciate an
CLO 4 describe how 'Omics' data are used in Systems Biology to understand the integrated				
LO 3 describe basic analytical methods, and access database resources generated in major 'C				
CLO 2 describe common methodologies used in major 'Omics' studies				
			studies and	d traditional one
ics - the stu iptomics - t nics - the st omes - the s biology a al system, nomics - all	udy of all genes or DNA sequences in the study of all mRNA transcripts tudy of all proteins study of all genetic or physical interand functional genomics - the study of and modeling to discover the integral I genetic materials found in an enviro	n a genome actions among genes or p f the interactome/networl ted function and emerger comment	oroteins k between	components of
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 high-throughput methodologies involved in: Genomics - the study of all genes or DNA sequences in a genome				
	as well as urse covers cing, componences - the stu- iptomics - the stu- iptomics - the stu- iptomics - the stu- iptomics - the stu- is biology a al system, nomics - al omics - man in the studies describe of the system identify quality and the system identify quality and sem Demon attaining evidences in Demon course	as well as those preparing their research proportices covers various OMICS techniques with spoing, computational modeling, and statistic proportices of the study of all genes or DNA sequences in into a statistic proportices. The study of all genes or DNA sequences in into a statistic proportices of the study of all proteins of the study of all proteins of the study of all genetic or physical interests biology and functional genomics - the study of all system, and modeling to discover the integral nomics - all genetic materials found in an environmics - all genetic materials found in an environmics - metabolites & intermediates involved in the sessful completion of this course, students should explain the conceptual differences between 'Congene approach, and discuss the prosident and condescribe basic analytical methods, and accessfudies describe how 'Omics' data are used in System the system identify questions that can be addressed by 'Congene applications in 'Omics' studies and studies of BIOL3211 Nutrigenomics or BIOL3401 Mology or BIOL3403 Immunology or BIOL3404 Proposition of BIOC3604 Essential techniques attaining all the course learning outcomes. Shows evidence of original thought, and ability to apply situations. Apply highly effective organizational and pomonstrate substantial command of a broad range.	as well as those preparing their research proposal. Trise covers various OMICS techniques with special focus on sequence cing, computational modeling, and statistic programming. This course on experience in large scale data analysis, and high-throughput methodo cs - the study of all genes or DNA sequences in a genome iptomics - the study of all mRNA transcripts mics - the study of all proteins omes - the study of all genetic or physical interactions among genes or ps biology and functional genomics - the study of the interactome/networ all system, and modeling to discover the integrated function and emergenomics - all genetic materials found in an environment formics - metabolites & intermediates involved in a biological reaction. Tressful completion of this course, students should be able to: explain the conceptual differences between 'Omics'/Systems Biology's gene approach, and discuss the pros and cons of both approaches describe common methodologies used in major 'Omics' studies describe basic analytical methods, and access database resources gestudies describe how 'Omics' data are used in Systems Biology to understand the system identify questions that can be addressed by 'Omics' and System Biology or BIOL3211 Nutrigenomics or BIOL3401 Molecular biology or BIOL309 or BIOL3403 Immunology or BIOL3404 Protein structure and function Metabolism or BIOC3604 Essential techniques in biochemistry and resultationing all the course learning outcomes. Show strong analytical and critical a evidence of original thought, and ability to apply knowledge to a wide range of situations. Apply highly effective organizational and presentational skills. Demonstrate substantial command of a broad range of knowledge and skills require	urse covers various OMICS techniques with special focus on sequence alignmenting, computational modeling, and statistic programming. This course will also on experience in large scale data analysis, and high-throughput methodologies invoces the study of all genes or DNA sequences in a genome iptomics - the study of all mRNA transcripts nices - the study of all proteins or physical interactions among genes or proteins is biology and functional genomics - the study of the interactome/network between all system, and modeling to discover the integrated function and emergent propertinomics - all genetic materials found in an environment formics - all genetic materials found in an environment formics - metabolites & intermediates involved in a biological reaction. Dessful completion of this course, students should be able to: Explain the conceptual differences between 'Omics'/Systems Biology studies an gene approach, and discuss the pros and cons of both approaches describe common methodologies used in major 'Omics' studies Dessful common methodologies used in Systems Biology to understand the integrithe system Identify questions that can be addressed by 'Omics' and System Biology studies describe applications in 'Omics' studies Degry or BIOL3403 Immunology or BIOL3404 Protein structure and function or BIOL of Metabolism or BIOC3604 Essential techniques in biochemistry and molecular and sem Demonstrate thorough and complete mastery at an advanced level of extensive knowledge a attaining all the course learning outcomes. Show strong analytical and critical abilities and evidence of original thought, and ability to apply knowledge to a wide range of complex, fa situations. Apply highly effective organizational and presentational skills.

BIOL4501 Molecular phylo	Academic Year	2015	
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-of-the systematics and phylogenetic research, focusing on in depth coverage of the latest te treatment of theoretical issues 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 likelihood appro- introduction to relevant software for phylogenetics - methods for the evaluation of phylogene trees							chniques. The
Course Contents & Topics	Introduction to molecular systematics and phylogenetics. Tree of life. Obtaining, storing and archivispecimens and tissue samples for use in molecular studies. Sources of molecular data, experiment design for molecular studies, taxon sampling and marker choice. Overview of basic laboratory methods data collection (DNA isolation, PCR, DNA sequencing). Sequence editing and aligning; utilizing put sequence databases. Estimation of nucleotide polymorphism and diversity. Methods for phylogereconstruction: parsimony, distance methods, maximum likelihood, Bayesian methods. Statistical method for the evaluation of phylogenetic trees. Software for phylogeny reconstruction. Molecular markers conservation and ecological genetics. Phylogenies for different organisms. Biogeography phylogeography using molecular data.							, experimenta ry methods for utilizing public for phylogeny stical methods ar markers in
Course Learning Outcomes	On succes	sful co	mpletion of this course, student	ts shou	uld be able to:			
	CLO 1 u	ndersta	nd the fundamental principles	of mole	ecular phylogenetic	cs		
	CLO 2 u	ndersta	nd the purposes each methods) for the analysis of given data	l is us	. , ,		the mos	st appropriate
	CLO 3 u	ndersta	nd the advantages and disadva	antage	es of the methods			
	CLO 4 a	cquire p	oractical skills for the analysis o	of mole	cular data			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Bl	OL340′	Molecular biology or BIOL340	08 Gen	netics			
Offer in 2015 - 2016	N					Examinatio	n	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	Demonstrate comprehensive knowledge and an advanced level of skills sufficient for achieving all the goals and expected learning outcomes of the course. Show deep understanding of the course subject. Excellent ability to efficiently combine and apply the relevant theories, principles, and methods taught in the course. Advanced skills in possession and application of the methods and software for evolutionary analysis of real data. Excellent ability to collect, systematize, analyze and critically evaluate data from various sources and to quote them appropriately. Excellent presentational skills. B Demonstrate good knowledge and good level of skills sufficient for accomplishing most of the goals and expected learning outcomes of the course. Demonstrate good understanding of the course subject. Show good ability to combine and to apply theories, principles, and methods taught in the course. Substantial skills in possession and application of the methods and software for molecular evolutionary analysis of real data. Show good ability to collect,							
	С	systematize, analyze and critically evaluate data from various sources and to quote them appropriately. Good presentational skills. 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							
	Fail	of the theorie and so	nstrate poor or no knowledge and skill course. Demonstrate very poor or no es, principles, and methods taught in the offware for molecular evolutionary and so and to systematize, analyze and every service or no systematize.	understane cours lysis of	anding of the subject. Se. Poor or no skills in preal data. Show very p	Show no ability possession and poor or no ability	to combin application ty to collect	e and/or to apply on of the methods of the methods
Course Type	Lecture wi	th laboi	ratory component course					
Course Teaching	Activities	3		Deta	ails			No. of Hours
& Learning Activities	Lectures							24
	Laborator	у			nputer oratory/tutorial/proj	ects		36
	Reading /	Self st	udy					100
Assessment Methods and Weighting	Methods		Details		Weighting in fin			ent Methods CLO Mapping
	Assignme	ents				40	CLO 2	,3,4
	Examinat	ion				60	CLO 1	,2,3
Required/recommended reading and online materials			S.: Molecular Evolution and Fes Made Easy (Sinauer, 2004,			Iniversity Pi	ess, 20	00) Hall B.G.
Course Website	http://moo	dle.hku	.hk/					

BIOL4861 Ecology & biodi	versity	ınternsnı	h (o creaits)		Academi	c rear	2015	
Offering Department	Biologic	al Sciences	.		Quota			
Course Co-ordinator	Dr T Vei	Vengatesen, Biological Sciences (rajan@hku.hk)						
Teachers Involved	All acad	emic staff i	n Ecology & Biodiversity Major, I	Biological Science	es			
Course Objectives	apply th	rovide a stimulating experience for all Ecology & Biodiversity Major undergraduates to integrate and their knowledge and skills obtained from the Ecology & Biodiversity Major through gaining work rience in the field of Ecology & Biodiversity that are related to the major of study.						
Course Contents & Topics	Universi obtained	ty in a com I by studen	s course will work as an intern pany, government department of ts themselves. In the latter case r that the students are taking an	or NGO. The inter e, the internship r	nship may be nust be in a re	arranged elevant fie	by the School old to the Ecolog	
Course Learning Outcomes	On succ	essful com	pletion of this course, students s	should be able to:				
	CLO 1	CLO 1 gain first hand work experience in a job placement related to their Ecology & Biodiversity Major						
	CLO 2	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	n of the real work	environment			
	CLO 4	extend the	ir network in their field of study					
Pre-requisites (and Co-requisites and Impermissible combinations)			cology & Biodiversity Major student is allowed to take this co		3 study.			
Offer in 2015 - 2016	Y 1:	st sem 2n	nd sem Summer		Examina	tion	No Exam	
Offer in 2016 - 2017	Υ							
Course Grade	Pass/Fa	il						
Grade Descriptors	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.							
	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	Internsh	ip						
Course Teaching	Activiti	es		Details			No. of Hours	
& Learning Activities	Internsl	nip work		at least 160 hou	irs		160	
Assessment Methods and Weighting	Method	ls	Details	Weighting course gr			sment Methods o CLO Mapping	
	Written	report	written report, supervise feedback and oral presentation		100	CLO	1,2,3,4	
Course Website	http://wv	w.biosch.h	nku.hk/ecology/lsc/					
Additional Course Information	presenta work i.e. Enrolme through	ation about the institut nt of this the relevan	is course have to submit a w their internships, which will be ion offering the internship will al- course is not conducted via that the Department/School office after ernship is not a Capstone Course	assessed by inte so submit an asso le online course approval has be	rnal supervison essment report selection sys	ors. Stude rt to the U stem and	nt's supervisor a niversity. should be made	

BIOL4911 Conservation s	science in practice (6 credits)	Academic Year	2015				
Offering Department	Biological Sciences Quota 15						
Course Co-ordinator	Prof Y J Sadovy, Biological Sciences (yjsadovy@hku.hk)						
Teachers Involved	Prof Y J Sadovy, Biological Sciences						
Course Objectives	biodiversity and environmental science by using case studies that stim and concepts learned to produce and successfully debate a topic in conspecifically address the use of science in achieving meaningful consecutive need for considering social, economic, and political contexts. Studies	To build on the foundation acquired by students in the Biological Sciences in the fields of ecolog biodiversity and environmental science by using case studies that stimulate them to integrate the principle and concepts learned to produce and successfully debate a topic in conservation science. Case studies we specifically address the use of science in achieving meaningful conservation outcomes taking into account the need for considering social, economic, and political contexts. Students will be expected to present the cases orally using sound practical and scientific reasoning. This course is a capstone course for Ecology Biodiversity major students.					
Course Contents & Topics	This course will use directed case studies to give students the opp solutions to specific problems in conservation and the application of world, and within the wider context of economic development, puncertainty.Projects will be conducted through collaborations with lock Kong and Ocean Park, and address real-life questions and issues ecosystem services, biological footprints, wildlife trade, to assessment	conservation science consideration consideration al organizations, suce. Possible case stu	ce in the modern ns and scientific th as WWF-Hong udies range from				

	livelihoo	ds. Tutorials b	ation and biodiversity instrume by the course coordinator will specific issues of relevance a	introduce	practical conser		•		
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1	CLO 1 have an in-depth understanding of the topic studied, the major issues involved and the needs and prospects for further work in the area							
	CLO 2 have developed investigative skills associated with the case study selected which include synthesis, organization and presentation of information								
	CLO 3	CLO 3 understand the importance and complexities of conserving biodiversity							
	CLO 4	CLO 4 be able to identify practical and scientifically defensible initiatives and measures for successful conservation intervention							
	CLO 5	be able to co	mpetently present the case s	tudy and	convincingly argu	ue their c	ase		
Pre-requisites (and Co-requisites and Impermissible combinations)	(BIOL3) This cap	XXX or BIOL42 ostone course	credits of advanced leve XXX) in the Ecology & Biodivi is for Ecology & Biodiversity dent is allowed to take this ca	ersity Majo Major stud	or including BIOI dents only.	_3303 C	onservation ecology.		
Offer in 2015 - 2016	Y 2	nd sem			Exa	minatio	n No Exam		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all course learning outcomes. Show strong analytical and critical abilities and logical thinking, with strong evidence of ability to integrate and synthesize information across subject areas, including from practical work undertaken, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations and showing consideration of practical and political dimensions for addressing conservation challenges. Apply highly effective presentational skills. Strong evidence of attention to thoughtful and reflective thinking and consideration of the wider issues of biodiversity conservation for Society.							
	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, with some integration of materials and ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate effective presentational skills. Some evidence of clear attention to thoughtful and reflective thinking and attention to detail. Consideration of practical components in conservation management must be demonstrated including the importance of biodiversity conservation in Society.							
	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, 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.							
	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 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 & Learning Activities	Activit	ies		Details			No. of Hours		
a Learning Activities	Readin	g / Self study		supervised practical work of at least 80 hours followed by written & oral reports. Tutorials provided by course coordinator			120		
Assessment Methods and Weighting	Method	ds	Details		Weighting in fin course grade (Assessment Methods to CLO Mapping		
	Oral pr	esentation				40	CLO 1,2,4,5		
	Resear	ch report	project report			60	CLO 1,2,3,4,5		
Course Website	http://wv	ww.biosch.hku	ı.hk/ecology/lsc/						
Additional Course Information	This cou	urse will be off	ered subject to a minimum er	nrollment i	number and avai	lability of	f teachers.		

BIOL4912 Sensory evalua	ntion of food (6 credits)	Academic Year	2015					
Offering Department	Biological Sciences	Quota	20					
Course Co-ordinator	Prof H Corke, Biological Sciences (harold@hku.hk)							
Teachers Involved	Prof H Corke, Biological Sciences							
Course Objectives		To provide a broad understanding of the physiological and psychological basis of human sensory perception of food. To develop expertise in the choice and application of sensory techniques, and analysis of sensory data, in food science and consumer research.						
Course Contents & Topics								

	descriptive food oral p	analysis, a processing,	s, planning and conduct of ffective testing. Instrume shelf-life studies, expe management, and consu	ent-sensory ert panels.	relationships, texture a Case studies of senso	nd arom	a profiles,	
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 understand the psychophysiological basis for human sensory perception of food							
	CLO 2 ur	derstand th	ne major techniques use	d in sensory	y testing			
		•	sory evaluation reports, a chosen methods	and to desig	gn and conduct sensory	evaluat	ion projects using	
Pre-requisites (and Co-requisites and Impermissible combinations)	(BIOL3XXX) This capsto	Pass in at least 24 credits of advanced level disciplinary core/elective biological sciences courses BIOL3XXX or BIOL4XXX) in the Food & Nutrional Science Major including BIOL3201 Food Chemistry 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.						
Offer in 2015 - 2016	Y Sum	mer			Examinat	ion	No Exam	
Offer in 2016 - 2017	Υ				·			
Course Grade	A+ to F							
Grade Descriptors	A	thinking, wi	e thorough grasp of the subje th evidence of creative ability echniques and analysis of dat bemonstrate highly effective tea	and compete a and results	ence in professional-level pro to draw appropriate and ins	oblem solv ightful con	ing. Critically use lab	
	В	B Demonstrate substantial grasp of the subject matter covered. Show evidence of analytical and critical abilities a logical thinking with some evidence of competence in professional-level problem solving. Use lab skills a techniques and analysis of data and results to draw generally appropriate conclusions to real-world problem Demonstrate effective team-based organizational and presentational skills.						
	С	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 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 to inappropriate and usually erroneous conclusions to real-world problems. Demonstrate ineffectiveness team-based organizational and presentational skills.							
Course Type	Laboratory	and works	hop course					
Course Teaching	Activities			Details	.		No. of Hours	
& Learning Activities	Laboratory						48	
	Project wo						48	
	Tutorials			lecture	s/tutorials		24	
	Reading /	Self study					30	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		ssment Methods to CLO Mapping	
	Laboratory	/ reports			20		CLO 2,3	
	Project rep	•			60		CLO 2,3	
	Test				20		CLO 1,2,3	
Required/recommended			L. (2004) Sensory Evalu Laboratory Exercises for			er		
reading and online materials	Lawless, H	.1. (2013) 1	Laboratory Excroloco for	Serisory L	valuation - Springer			
3	http://mood	. ,	Laboratory Exercises for	Sensory Ev	valuation - Springer			

BIOL4962 Food & nutritio	nal science internship (6 credits)	Academic Year	2015			
Offering Department	Biological Sciences Quota					
Course Co-ordinator	Dr J C Y Lee, Biological Sciences (jettylee@hku.hk)					
Teachers Involved	All academic staff in Food & Nutritional Science Major, Biological Scien	ces				
Course Objectives	To provide a stimulating experience for all Food & Nutritional Science Major undergraduates to integrate apply their knowledge and skills obtained from the Food & Nutritional Science Major through gaining we experience in the field of Food & Nutritional Science 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 University or outside the University in a company, government depart arranged by the School or obtained by students themselves. In the la relevant field to the Food & Nutritional Science Major that the students course coordinator is required	ment or NGO. The interns	nternship may be ship must be in a			

Course Learning Outcomes	On succ	essful com	pletion o	of this course, student	sho	uld be able to:		
	CLO 1	gain first h	and wo	rk experience in a job	olace	ment related to the	ir Food & Nut	ritional Science Major
	CLO 2 apply the knowledge in their Food & Nutritional Science Major in solving practical problems in the work place							
	CLO 3	acquire an	unders	tanding and appreciat	on of	the real work envi	ronment	
	CLO 4	extend the	ir netwo	ork in their field of stud	y			
Pre-requisites (and Co-requisites and Impermissible combinations)	(BIOL3X	XXX or BIOL stone cour	_4XXX) se is for	dits of advanced let in the Food & Nutrition Food & Nutritional So is allowed to take this	nal So ience	cience Major. Major students on	ıly.	cal sciences courses
Offer in 2015 - 2016	Y 19	st sem 2n	d sem	Summer			Examination	No Exam
Offer in 2016 - 2017	Υ							
Course Grade	Pass/Fa	il						
Grade Descriptors	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	Internsh	ip						
Course Teaching	Activities Details No. of Hours							
& Learning Activities	Internsl	nip work			ех	least160 hours cluded) in at leas ays		
Assessment Methods and Weighting	Method	ls	Details	S		Weighting in fi		ssessment Methods to CLO Mapping
	Written	report		report, employer's fed al presentation	back		100	CLO 1,2,3,4
Course Website	http://mo	odle.hku.h	k					
Additional Course Information	presenta supervis the Univ Satisfac internsh Students Enrolme	ation about or at work i ersity. tory complip will be resulted that the state of this	their into i.e. the interested ecorded interested course	I on the student's traid to enrol in this cours is not conducted via	assenterns counscripe sho	ssed by internal suship will also submoted towards the t. This course will uld contact the Deponline course sele	upervisors. St it an assessm Capstone re be assessed partment to o ction system	udent's nent report to equirement. Details of d on "Pass/Fail" basis.

BIOL4963 Molecular biolog	gy & bio	technology internship (6 credits)	Academic Year	2015				
Offering Department	Biologic	al Sciences	Quota					
Course Co-ordinator	Dr W K	Yip, Biological Sciences (wkyip@hku.hk)						
Teachers Involved	All acad	emic staff in Molecular Biology & Biotechnology Major, Biologic	al Sciences					
Course Objectives	integrate through	provide a stimulating experience for all Molecular Biology & Biotechnology Major undergraduates egrate and apply their knowledge and skills obtained from the Molecular Biology & Biotechnology Maough gaining work experience in the field of Molecular Biology & Biotechnology that are related to a gior of study.						
Course Contents & Topics	Universi arrange relevant	Students taking this course will work as an intern for at least 160 hours in at least 20 working days within University or outside the University in a company, government department or NGO. The internship ma arranged by the School or obtained by students themselves. In the latter case, the internship must be relevant field to the Molecular Biology & Biotechnology Major that the students are taking and prior appriby the course coordinator is required.						
Course Learning Outcomes	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 Molecular Biology & Biotechnology Major							
	CLO 2 apply the knowledge in their Molecular Biology & Biotechnology Major in solving practical problems in the work place							
	CLO 3	acquire an understanding and appreciation of the real work en	vironment					
	CLO 4 extend their network in their field of study							
Pre-requisites (and Co-requisites and Impermissible combinations)		at least 24 credits of advanced level disciplinary core/(XXX or BIOL4XXX) in the Molecular Biology & Biotechnology M		sciences course				

		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 2015 - 2016	Y 1st sem	2nd sem Summer		Е	camination	No Exam			
Offer in 2016 - 2017	Υ			<u> </u>					
Course Grade	Pass/Fail								
Grade Descriptors	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 excellen performance in the above would be awarded a grade of "Distinction".								
	ass	y limited or no ability to solve problet igned by supervisor(s). Fails to e eagues, or clients in the job. Fails to rs, written and oral report, or evaluat	stablish ef satisfy the	fective collaboration or of requirements set out in t	communication w	ith supervisor(s), other			
Course Type	Internship								
Course Teaching	Activities			Details		No. of Hours			
& Learning Activities	Internship worl	Internship work			(lunch hour 20 working	160			
Assessment Methods and Weighting	Methods	Details	Details		al Ass %)	Assessment Methods to CLO Mapping			
	Written report	written report, su feedback and oral prese	pervisor's ntation	10	00 C	LO 1,2,3,4			
Course Website	http://moodle.hl	ku.hk							
Additional Course Information	presentation ab supervisor at we the University. Satisfactory co internship will b Students who a Enrolment of the	this course have to submit a out their internships, which work i.e. the institution offering mpletion of this course car be recorded on the student's re interested to enrol in this course is course is not conducted evant Department/School office	ill be ass the interr be cou transcrip ourse sho via the	essed by internal supnship will also submit unted towards the Opt. This course will bould contact the Depart online course select	ervisors. Stud- an assessmer Capstone require assessed of artment to obta- tion system at	ent's nt report to uirement. Details o on "Pass/Fail" basis ain the approval. nd should be made			

BIOL4964 Biological scien	ces inte	nship (6 credits)		Academic Year	2015				
Offering Department	Biologica	Sciences		Quota					
Course Co-ordinator	Dr J S H	r J S H Tsang, Biological Sciences (jshtsang@hku.hk)							
Teachers Involved	All acade	Il academic staff in Biological Sciences Major, Biological Sciences							
Course Objectives	their kno	o provide a stimulating experience for all Biological Sciences major undergraduates to integrate and a eir knowledge and skills obtained from the Biological Sciences Major through gaining work experience e field of Biological Sciences that are related to the major of study.							
Course Contents & Topics	Universit arranged relevant	tudents taking this course will work as an intern for at least 160 hours in at least 20 working days we niversity or outside the University in a company, government department or NGO. The internship rranged by the School or obtained by students themselves. In the latter case, the internship must levant field to the Biological Sciences major that the students are taking and prior approval by the pordinator is required							
Course Learning Outcomes	On succe	ssful completion of this course, students s	should be able to:						
	CLO 1 gain first hand work experience in a job placement related to their Biological Sciences Major								
	CLO 2 apply the knowledge in their Biological Sciences 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)	(BIOL3X) This capt	at least 24 credits of advanced leve X or BIOL4XXX) in the Biological Science one course is for Biological Sciences Ma st that a student is allowed to take this ca	es Major. ijor students only.	· ·	sciences course				
Offer in 2015 - 2016	Y 1s	sem 2nd sem Summer		Examination	No Exam				
Offer in 2016 - 2017	Υ								
Course Grade	Pass/Fai								
Grade Descriptors	Pass	Pass Able to apply knowledge to solve problems in the workplace. Successfully handles and carries out the work require the job or assigned by supervisor(s). Establishes effective collaboration and communication with supervisor colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description regar working hours, written and oral report, and evaluation by supervisor(s), etc. Students demonstrating exceptormance 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	Internship								
Course Teaching & Learning Activities	Activities	Activities								
Assessment Methods and Weighting	Internship work		at least160 hours (lunch hour excluded) in at least 20 working days							
	Methods	Details	Weighting in final As course grade (%)		,	ssessment Methods to CLO Mapping				
	Written report	written report, employer's feeback and oral presentation			CLC	CLO 1,2,3,4				
Course Website	http://moodle.hku	ı.hk								
Additional Course Information	presentation about supervisor at work the University. Satisfactory compineering will be Students who are Enrolment of this	his course have to submit a written ut their internships, which will be as it i.e. the institution offering the interpletion of this course can be concerned on the student's transce interested to enrol in this course is course is not conducted via the ant Department/School office after	esessed by ir ernship will all ounted towaript. This co should contact online cou	nternal supervisors Iso submit an as ards the Capstor urse will be asset the Department urse selection sy	ors. Studer sessment one requir sessed on nt to obtain ystem and	nt's report to rement. Details o "Pass/Fail" basis the approval. I should be made				

BIOL4991 Ecology & biodi	_		Academic Year	2015			
Offering Department	Biologic	al Sciences	Quota				
Course Co-ordinator	Prof G A	Williams, Biological Sciences (hrsbwga@hku.hk)					
Teachers Involved	All acad	Il academic staff in Ecology & Biodiversity Major, Biological Sciences					
Course Objectives	and app	To provide a stimulating capstone experience for Ecology & Biodiversity Major undergraduates to integ and apply their knowledge and skills obtained from the Ecology & Biodiversity Major through planning carrying out a research project under the supervision of a member of staff.					
Course Contents & Topics	admissi	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 Outcomes	On succ	essful completion of this course, students should be able to:					
	CLO 1	critique and review appropriate scientific literature					
	CLO 2	use this information to generate a scientifically relevant rese	arch question				
	CLO 3	develop and formulate scientific hypotheses to test this ques	stion				
	CLO 4	design and undertake practical research work to formally tes	st the hypotheses prop	osed			
	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 discuss their research findings and place them into a holistic scientific context						
	CLO 8	submit their work following a specified journal format, presetalk	ent their work as a sci	entific conference			
Pre-requisites (and Co-requisites and Impermissible combinations)	(BIOL3) Cumula Student This cap	at least 24 credits of advanced level disciplinary cor (XXX or BIOL4XXX) in the Ecology & Biodiversity Major; and tive GPA of 3.0 or above. Is are not permitted to take both BIOL3991 and BIOL4991. In order to the student of the students on the student of th	ly.	sciences course			
Offer in 2015 - 2016	Y Y	ear long	Examination	No Exam			
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	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 analytical skills and laboratory/fieldwork techniques. Demonstrate co professional presentation of research work.	of relevant literature and identify and identify pothesis. Show excellent	entification of research organizational and/o			
	В						
	С	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 necessaril critical, assessment of results and presentation of research work.					
	D	critical, assessment of results and presentation of research work. 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					

		oratory/fieldwork techniques. Demonstion of research work.	trate confused and poorly organized	assessmer	nt of results and limited	
	are not a designed analytica	Evidence of poor or inadequate understanding and grasp of the subject matter such that most of the learni are not attained. Poor critique and knowledge of relevant literature and identification of research hypothesigned experimental approach to test research hypothesis. Show little evidence of appropriate organiza analytical skills and laboratory/fieldwork techniques. Demonstrate incorrect interpretation and assessment and poor presentation of research work.				
Course Type	Project-based cours	se				
Course Teaching	Activities		Details		No. of Hours	
& Learning Activities	Reading / Self stud	iy	formal lectures, seminal practical work	rs &	144	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Ass	essment Methods to CLO Mapping	
	Dissertation		80	CLO	1,2,3,4,5,6,7,8	
	Oral presentation research seminar		20 CLO 1,2,3,4,5,6,7		D 1,2,3,4,5,6,7	
Course Website	http://www.biosch.h	ku.hk/ecology/lsc/				
Additional Course Information	A dissertation of ab	out 9,000 - 12,000 words (80%	weighting) and a research se	minar (20	0% weighting).	

BIOL4992 Food & nutrition	nal scier	nce project (12 credits)	Academic Year	2015			
Offering Department	Biologic	al Sciences	Quota				
Course Co-ordinator	Prof N F	rof N P Shah, Biological Sciences (npshah@hku.hk)					
Teachers Involved	All acad	Il academic staff in Food & Nutritional Science Major, Biological Sciences					
Course Objectives	integrate	To provide a stimulating capstone experience for Food & Nutritional Science Major undergraduates integrate and apply their knowledge and skills obtained from the Food & Nutritional Science Major through lanning 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 Outcomes	On succ	essful completion of this course, students should be able to:					
	CLO 1	critique and review appropriate scientific literature					
	CLO 2	use this information to generate a scientifically relevant resear	ch question				
	CLO 3	develop and formulate scientific hypotheses to test this question	on				
	CLO 4	design and undertake practical research work to formally test	the hypotheses prop	osed			
	CLO 5	analyse and evaluate the data collected to test the hypothemanner to illustrate the outcomes	eses, present data	in a professional			
	CLO 6	CLO 6 draw an objective series of conclusions based on the experimental work					
	CLO 7	CLO 7 highlight and 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)	(BIOL3) Cumulat This cap	at least 24 credits of advanced level disciplinary core/ (XX or BIOL4XXX) in the Food & Nutritional Science Major; and ive GPA of 3.0 or above. stone course is for Food & Nutritional Science Major students iest that a student is allowed to take this capstone course is the	d only.	sciences courses			
Offer in 2015 - 2016	Y Y	ear long	Examination	No Exam			
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	Evidence of complete or near-complete understanding and a thorough g attainment of all learning outcomes. Excellent critique and knowledge of hypothesis. Well designed experimental approach to test research hypanalytical skills and laboratory/fieldwork techniques. Demonstrate comprofessional presentation of research work.	relevant literature and ide othesis. Show excellent	ntification of research organizational and/or			
	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.					

	are not a designed analytical and poor	ttained. Poor critique and knowledge experimental approach to test resear skills and laboratory/fieldwork techr presentation of research work.	and grasp of the subject matter such the of relevant literature and identification rich hypothesis. Show little evidence of iniques. Demonstrate incorrect interpretations.	on of research appropriate or	hypothesis. Badly ganizational and/or	
Course Type	Project-based cours	e				
Course Teaching & Learning Activities	Activities		Details		No. of Hours	
a Learning Activities	Reading / Self study		formal lectures, seminars a practical work		144	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)		ment Methods CLO Mapping	
	Dissertation		80	CLO 1,2	,3,4,5,6,7,8	
	Oral presentation	research seminar	20		.O 5,7	
Course Website	http://moodle.hku.hk	I				
Additional Course Information	A dissertation of abo	out 9,000 - 12,000 words (80%	weighting) and a research ser	ninar (20%	weighting).	

BIOL4993 Molecular biolog	gy & biot	echnology project (12 credits)	Academic Year	2015			
Offering Department	Biologica	Sciences	Quota				
Course Co-ordinator	Dr W K Y	or W K Yip, Biological Sciences (wkyip@hku.hk)					
Teachers Involved	All acade	Il academic staff in Molecular Biology & Biotechnology Major, Biological Sciences					
Course Objectives	undergra Biotechno	To provide a stimulating capstone experience for all Molecular Biology & Biotechnology Maj undergraduates to integrate and apply their knowledge and skills obtained from the Molecular Biology Biotechnology Major through planning and carrying out a research project under the supervision of member of staff.					
Course Contents & Topics	to the co	Students should seek approval from a prospective supervisor prior to selecting this course. After admissi to the course is approved by the course coordinator, students will complete their project work under to guidance of their supervisor.					
Course Learning Outcomes	On succe	ssful completion of this course, students should be able to:					
	CLO 1	critique and review appropriate scientific literature					
	CLO 2	use this information to generate a scientifically relevant resea	rch question				
	CLO 3	develop and formulate scientific hypotheses to test this questi	on				
	CLO 4	design and undertake practical research work to formally test	the hypotheses prop	osed			
	CLO 5	analyse and evaluate the data collected to test the hypothese	S				
	CLO 6	present data in a professional manner to illustrate the outcom	es				
	CLO 7 draw an objective series of conclusions based on the experimental work						
	CLO 8	highlight and discuss their research findings and place them i	nto a holistic scientifi	c context			
(and Co-requisites and Impermissible combinations)	Cumulation This caps	(X or BIOL4XXX) in the Molecular Biology & Biotechnology M ye GPA of 3.0 or above. tone course is for Molecular Biology & Biotechnology Major st est that a student is allowed to take this capstone course is the	tudents only. eir year 3 study.	No Form			
Offer in 2015 - 2016		ar long	Examination	No Exam			
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	Α	Evidence of complete or near-complete understanding and a thorough g attainment of all learning outcomes. Excellent critique and knowledge of hypothesis. Well designed experimental approach to test research hyp analytical skills and laboratory/fieldwork techniques. Demonstrate comp professional presentation of research work.	relevant literature and ider othesis. Show excellent	ntification of research organizational and/or			
	В	Evidence of near-complete understanding and a good grasp of the subject matter as demonstrated by attainment of majority of learning outcomes. Good critique and knowledge of relevant literature and identification of resemptorials, Appropriately designed experimental approach to test research hypothesis. Show good organizat and/or analytical skills and laboratory/fieldwork techniques. Demonstrate effective, critical, assessment of results good presentation of research work.					
	С	Evidence of adequate understanding and grasp of the subject matter as demonstrated by general but incomp attainment of most of the learning outcomes. Acceptable critique and knowledge of relevant literature and identifica of research hypothesis. Adequately designed experimental approach to test research hypothesis. Show organizational and/or analytical skills and laboratory/fieldwork techniques. Demonstrate adequate but not necessar 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.					
		presentation of research work.					

		skills and laboratory/fieldwork to presentation of research work.	echniques. De	emonstrate incorrect interpreta	ation and	assessment of results		
Course Type	Project-based course							
Course Teaching	Activities		Detai	ls		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 (%)	Asse	essment Methods to CLO Mapping		
	Dissertation			80	CLO	1,2,3,4,5,6,7,8		
	Oral presentation	research seminar		20	С	LO 1,6,7,8		
Course Website	http://moodle.hku.hk	/						
Additional Course Information	A dissertation of abo	ut 9,000 - 12,000 words (8	30% weighti	ing) and a research sem	nar (20	% weighting).		

	ices proj	t (12 credits)	Academic Year	2015			
Offering Department	Biologica	ciences	Quota				
Course Co-ordinator	Dr J S H	Or J S H Tsang, Biological Sciences (jshtsang@hku.hk)					
Teachers Involved	All acade	All academic staff in Biological Sciences Major, Biological Sciences					
Course Objectives	and appl	Fo provide a stimulating capstone experience for all Biological Sciences Major undergraduates to integ and apply their knowledge and skills obtained from the Biological Science Major through planning carrying out a research project under the supervision of a member of staff.					
Course Contents & Topics	to the co	Students should seek approval from a prospective supervisor prior to selecting this course. After admis to the course is approved by the course coordinator, students will complete their project work under guidance of their supervisor.					
Course Learning Outcomes	On succe	ful completion of this course, students should be	e able to:				
	CLO 1	tique and review appropriate scientific literature					
	CLO 2	e this information to generate a scientifically rele	evant research question				
	CLO 3	velop and formulate scientific hypotheses to tes	t this question				
	CLO 4	sign and undertake practical research work to fo	ormally test the hypotheses pro	posed			
	CLO 5	alyse and evaluate the data collected to test the	hypotheses				
	CLO 6	esent data in a professional manner to illustrate	the outcomes				
	CLO 7	aw an objective series of conclusions based on t	the experimental work				
	CLO 8 highlight and discuss their research findings and place them into a holistic scientific context						
(and Co-requisites and	(DIOL3//	or BIOL4XXX) in the Biological Sciences Major;	and				
Impermissible combinations)	Cumulative This caps	or BIOL4XXX) in the Biological Sciences Major; GPA of 3.0 or above. ne course is for Biological Sciences Major stude that a student is allowed to take this capstone of	nts only.				
•	Cumulative This caps The earlies	GPA of 3.0 or above. ne course is for Biological Sciences Major stude	nts only.	No Exam			
impermissible combinations)	Cumulative This caps	GPA of 3.0 or above. ne course is for Biological Sciences Major stude that a student is allowed to take this capstone c	nts only. ourse is their year 3 study.	No Exam			
Impermissible combinations) Offer in 2015 - 2016	Cumulative This caps The earlies	GPA of 3.0 or above. ne course is for Biological Sciences Major stude that a student is allowed to take this capstone c	nts only. ourse is their year 3 study.	No Exam			
Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017	Cumulativ This caps The earlie Y Ye	GPA of 3.0 or above. ne course is for Biological Sciences Major stude that a student is allowed to take this capstone c	nts only. course is their year 3 study. Examination I a thorough grasp of the subject matter knowledge of relevant literature and ide research hypothesis. Show excellent	er as demonstrated b entification of researc organizational and/c			
Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Cumulativ This caps The earlie Y Ye Y A+ to F	GPA of 3.0 or above. ne course is for Biological Sciences Major stude that a student is allowed to take this capstone colong Evidence of complete or near-complete understanding and attainment of all learning outcomes. Excellent critique and I hypothesis. Well designed experimental approach to test analytical skills and laboratory/fieldwork techniques. Demo	Examination I a thorough grasp of the subject matter and ider research hypothesis. Show excellent constrate comprehensive, critical, asserped the subject matter as demonstrate ledge of relevant literature and ider the to test research hypothesis. Show some point of the subject matter as demonstrate reledge of relevant literature and ider the total test research hypothesis. Show	er as demonstrated be sentification of research organizational and/conserved to the sentification of research of the sentification of research organizations of organizations.			
Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Cumulativ This caps The earlie Y Ye Y A+ to F	GPA of 3.0 or above. ne course is for Biological Sciences Major stude that a student is allowed to take this capstone colong Evidence of complete or near-complete understanding and attainment of all learning outcomes. Excellent critique and I hypothesis. Well designed experimental approach to test analytical skills and laboratory/fieldwork techniques. Demo professional presentation of research work. Evidence of near-complete understanding and a good gras majority of learning outcomes. Good critique and know hypothesis. Appropriately designed experimental approacand/or analytical skills and laboratory/fieldwork techniques	Examination I a thorough grasp of the subject matter knowledge of relevant literature and ideresearch hypothesis. Show excellent constrate comprehensive, critical, asserbledge of relevant literature and ideresearch hypothesis. Show excellent constrate comprehensive, critical, asserbledge of relevant literature and ider ch to test research hypothesis. Show is. Demonstrate effective, critical, asserbledge of relevant literature and ider ch to test research hypothesis. Show is printique and knowledge of relevant literature and iderental approach to test research hypothesis.	er as demonstrated bentification of researce organizational and/ossment of results and the diffication of researce organizations and the diffication of researce organizations assment of results and the diffication of results and identification of pothesis. Show fa			
Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Cumulative This caps The earlie Y Ye Y A+ to F A B	GPA of 3.0 or above. ne course is for Biological Sciences Major stude that a student is allowed to take this capstone colong Evidence of complete or near-complete understanding and attainment of all learning outcomes. Excellent critique and hypothesis. Well designed experimental approach to test analytical skills and laboratory/fieldwork techniques. Demo professional presentation of research work. Evidence of near-complete understanding and a good gras majority of learning outcomes. Good critique and know hypothesis. Appropriately designed experimental approact and/or analytical skills and laboratory/fieldwork techniques good presentation of research work. Evidence of adequate understanding and grasp of the sattainment of most of the learning outcomes. Acceptable cof research hypothesis. Adequately designed experim organizational and/or analytical skills and laboratory/fieldwork.	Examination I a thorough grasp of the subject matte knowledge of relevant literature and ide research hypothesis. Show excellent constrate comprehensive, critical, asserbledge of relevant literature and ider on the subject matter as demonstrate ledge of relevant literature and ider choto test research hypothesis. Show subject matter as demonstrated by gritique and knowledge of relevant literature and ider chore the subject matter as demonstrated by gritique and knowledge of relevant literature and identification of the subject matter as demonstrated by incomple for relevant literature and identification of hypothesis. Show fair organizational as	er as demonstrated bentification of researce organizational and/c ssment of results an and by attainment of the thification of researce or good organizations ssment of results an eneral but incomplet ature and identification ypothesis. Show fate but not necessaril te attainment of man feresearch hypothesis and/or analytical skill			
Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Cumulative This caps The earlief Y Ye Ye Ye A+ to F A B	GPA of 3.0 or above. ne course is for Biological Sciences Major stude that a student is allowed to take this capstone colong Evidence of complete or near-complete understanding and attainment of all learning outcomes. Excellent critique and hypothesis. Well designed experimental approach to test analytical skills and laboratory/fieldwork techniques. Demo professional presentation of research work. Evidence of near-complete understanding and a good gras majority of learning outcomes. Good critique and know hypothesis. Appropriately designed experimental approach and/or analytical skills and laboratory/fieldwork techniques good presentation of research work. Evidence of adequate understanding and grasp of the sattainment of most of the learning outcomes. Acceptable cof research hypothesis. Adequately designed experimorganizational and/or analytical skills and laboratory/fieldworkitical, assessment of results and presentation of research Evidence of limited understanding and grasp of the subject of the learning outcomes. Limited critique and knowledge of Poorly designed experimental approach to test research and laboratory/fieldwork techniques. Demonstrate confuse	Examination I a thorough grasp of the subject matte knowledge of relevant literature and ide research hypothesis. Show excellent constrate comprehensive, critical, asserbledge of relevant literature and ider to to test research hypothesis. Show so be constrate effective, critical, asserbledge of relevant literature and ider to to test research hypothesis. Show so be constrated by griftique and knowledge of relevant literature and identification of the subject matter as demonstrated by incomplet frelevant literature and identification of hypothesis. Show fair organizational and and poorly organized assessment of the subject matter such that most of the literature and identification of reseasis. Show little evidence of appropriate	er as demonstrated bentification of research organizational and/c ssment of results and by attainment of the thitification of research of the thitification of research of results and identification of research hypothesis. Show fate but not necessarill the attainment of mand for results and limite the learning outcome the learning outcome the learning outcome the progranizational and/corpognizational and/corpogn			

Course Teaching & Learning Activities	Activities		Deta	Details		No. of Hours	
a Learning Activities	Reading / Self study	/	formal lectures, seminars & practical work			144	
Assessment Methods and Weighting	Methods					ssessment Methods to CLO Mapping	
	Dissertation			80	CL	O 1,2,3,4,5,6,7,8	
	Oral presentation	research seminar		20	CL	O 1,2,3,4,5,6,7,8	
Course Website	http://moodle.hku.hk	/					
Additional Course Information	A dissertation of abo	A dissertation of about 9,000 - 12,000 words (80% weighting) and a research seminar (20% weighting).					

ENVS1301 Environmental	life scienc	e (6 credits)	A	cademic Year	2015		
Offering Department	Biological	Sciences	C	luota	40		
Course Co-ordinator	Dr T Veng	gatesen, Biological Sciences <i>(rajan</i>)	@hku.hk)				
Teachers Involved	Dr T Veng	Dr T Vengatesen, Biological Sciences					
Course Objectives	science a about the for critica	This course intended for students who wish to understand the fundamentals of environmental biology/I science and importantly the relationship (connection) between environment and life. Here you will lea about the various biological/ecological principles and concepts of environmental science which are need for critical discussion and evaluation of current global environmental issues including human ecologurbanization, ecological economics, and climate change.					
Course Contents & Topics	explore t environme will also le population that are interrelation about curi	This course is a combination of lectures, group discussion/debate and field trips cum tutorials. We explore the fundamental interactions between organisms and their environment. We then explenvironmental constraints on life at various ecosystems (like marine, freshwater, and terrestrial). Stude will also learn how factors such as urbanization, climate change, and anthropogenic impacts affect life population and ecosystem levels. Similarly, students will be exposed to the incredible interrelationsh that are basic to ecological principles and the impact that human development has upon the interrelationships. After learning basics of environmental life science, students will be stimulated to the about current life science issues such as biodiversity loss, organisms adaptation to climate change, trage of commons (human ecology) and applied life science topics such as biomaterial science.					
Course Learning Outcomes	On succe	ssful completion of this course, stud	ents should be able to:				
	CLO 1	understand life, environment and the	ir interactions				
	CLO 2	appreciate species and ecosystem re	esponses to human-induced	environmental ch	ange		
	CLO 3	CLO 3 attain ability to critically think and discuss about current environ-life science issues					
		be motivated and equipped: to tack advanced environmental science col	9	science questions	and to choose		
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL						
Offer in 2015 - 2016	Y 1st	sem	E	xamination	Dec		
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	A Evidence of original thought during the analysis of environmental life science issues. Show evidence of analytical critical and multidimensional thinking about the study subject. Extensive knowledge and skills required for attaining a the course learning outcomes. Demonstrate excellent ability to apply what you have learned in the class room to critically analyze the real environmental life science issues. Show highly effective organizational, presentational and field trip skills.					
	В	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.					
	С	C Show general but incomplete knowledge and original thought during the analysis of environmental life science issues. Fair knowledge and skills required for attaining all the course learning outcomes. Demonstrate fair ability to apply what you have learned in the class room to critically analyze the real environmental life science issues. Show considerable organizational, presentational and field trip skills.					
	D	D Evidence to show a minimum knowledge (i.e. knowledge is very incomplete) and thought during the analysi environmental life science issues. Show insufficient knowledge and skills required for attaining all the course learn outcomes. Demonstrate poor ability to apply what you have learned in the class room to critically analyze the environmental life science issues. Show very little organizational, presentational and field trip skills.					
	Fail	Evidence of meager or inadequate kno evidence of knowledge and skills requir apply what you have learned in the class no evidence of familiarity with relevar organizational and presentational skills.	ed for attaining all the course learn s room to critically analyze the real	ning outcomes. Demo environmental life sc	nstrate no ability to ience issues. Shov		
	Lecture w	ith laboratory component course					
Course Type	,						
Course Teaching	Activitie	s	Details		No. of Hours		
Course Type Course Teaching & Learning Activities	Activitie Lectures		Details		No. of Hours		

	Tutorials			12	
	Reading / Self s	study		100	
Assessment Methods and Weighting	Methods Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignments		10	CLO 2,3	
	Examination		70	CLO 1,3	
	Presentation	group presentation	10	CLO 3,4	
	Test		10	CLO 1	
Required/recommended reading and online materials	Appropriate read	ding materials/handouts will be	provided during the course.		
Course Website	http://www.biosc	h.hku.hk/ecology/lsc/			
Additional Course Information	This course will	be offered subject to a minimur	n enrollment number and availa	bility of teachers.	

ENVS2001 Environmenta	ai fieid and	a lab dealed (d di dalle)					
Offering Department	Biological	Sciences	Quota	30			
Course Co-ordinator	Dr D M B	r D M Baker, Biological Sciences (dmbaker@hku.hk)					
Teachers Involved	Dr D M B	Or D M Baker, School of Biological Science					
Course Objectives	science.	To introduce students to a broad spectrum of field and laboratory methods for data collection in environment cience. Through exposure to environmental data collection, experimental design, data analysis terpretation and reporting, students will gain a deeper appreciation of the process that underlienvironmental science research and it's relevancy to critical thinking and future careers in the sciences.					
Course Contents & Topics	will cover field-base study of the on exper	This course will involve environmental data collection in both field and laboratory settings. In-class lecture will cover basic principles of specific methodologies and relevant applications in preparation for laboratory a cield-based experiential learning. Having an interdisciplinary focus, the course will cover topics relevant to estudy of the biosphere, encompassing terrestrial, aquatic, and atmospheric systems. Students will gain hand on experience with the operation of standard and advanced sampling and analytical equipment, qualcontrol, basic data analysis and reporting.					
Course Learning Outcomes	On succe	ssful completion of this course, students should be ab	le to:				
	CLO 1	understand how scientific data is used to address envi	ronmental problems				
		nave a basic understanding of the techniques a environmental data	nd methodologies neces	sary for collecting			
		CLO 3 understand some of the problems inherent in data collection, and how this impacts data interpretation					
	CLO 4 understand how data collected in the lab and field can be used to critically evaluate ideas						
	CLO 4	anderstand now data collected in the lab and held can	be used to critically evalua	ite ideas			
(and Co-requisites and Impermissible	Pass in	ENVS1301 Environmental life science or ENVS1401 Blue planet or BIOL1309 Evolutionary diversity	•				
(and Co-requisites and Impermissible combinations)	Pass in EASC140	ENVS1301 Environmental life science or ENVS14	•				
and Co-requisites and mpermissible combinations) Offer in 2015 - 2016	Pass in EASC140	ENVS1301 Environmental life science or ENVS14 11 Blue planet or BIOL1309 Evolutionary diversity	01 Introduction to enviro	nmental science			
(and Co-requisites and impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017	Pass in EASC140	ENVS1301 Environmental life science or ENVS14 11 Blue planet or BIOL1309 Evolutionary diversity	01 Introduction to enviro	nmental science			
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in EASC140 Y 1st	ENVS1301 Environmental life science or ENVS14 11 Blue planet or BIOL1309 Evolutionary diversity	Examination Examination nalytical and critical abilities ark skills and techniques. Critical u	No Exam Indexidate thinking, with see of data and results to			
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	Pass in EASC140 Y 1st Y A+ to F	ENVS1301 Environmental life science or ENVS14- 11 Blue planet or BIOL1309 Evolutionary diversity Sem Demonstrate thorough grasp of the subject. Show strong a evidence of original thought. Apply highly effective lab / fieldwor	Examination Examination allytical and critical abilities ark skills and techniques. Critical uve organizational and presentationallytical and critical abilities and allytical and critical abilities and	No Exam Indexidate thinking, with se of data and results the solution of the			
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in EASC140 Y 1st Y A+ to F	ENVS1301 Environmental life science or ENVS14- D1 Blue planet or BIOL1309 Evolutionary diversity sem Demonstrate thorough grasp of the subject. Show strong a evidence of original thought. Apply highly effective lab / fieldwordraw appropriate and insightful conclusions. Apply highly effective lab / fieldwordraw appropriate and insightful conclusions. Apply highly effective lab / fieldwork skills and techniques. Correct use of	Examination Examination Examination Inalytical and critical abilities are k skills and techniques. Critical uve organizational and presentationallytical and critical abilities and data of results to draw appropose dence of some analytical and critical abilities and critic	No Exam No Exam Ind logical thinking, with se of data and results the small skills. Indicate conclusions. Applicate conclusions. Applicate conclusions and logical erroneous use of data			
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in EASC140 Y 1st Y A+ to F A B	ENVS1301 Environmental life science or ENVS14- 11 Blue planet or BIOL1309 Evolutionary diversity Sem Demonstrate thorough grasp of the subject. Show strong a evidence of original thought. Apply highly effective lab / fieldwordraw appropriate and insightful conclusions. Apply highly effective lab / fieldwordraw appropriate and insightful conclusions. Apply highly effective lab / fieldwork skills and techniques. Correct use of effective lab / fieldwork skills and techniques. Correct use of effective organizational and presentational skills. Demonstrate general but incomplete grasp of the subject. Evic thinking. Apply moderately effective lab / fieldwork skills and techniques.	Examination Examination Examination Examination Examination Inalytical and critical abilities are k skills and techniques. Critical uve organizational and presentational state of results to draw approposed and critical abilities and critical abilities. Mostly correct but some effective organizational and presentational and presentational and presentational information, of the subtical abilities. Apply partially effect.	No Exam No Exam Index logical thinking, with see of data and results the inal skills. Index logical thinking. Applicate conclusions. Applicate conclusions. Applicate conclusions and logicate erroneous use of data intational skills. Index logical thinking of data intational skills.			
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in EASC140 Y 1st Y A+ to F A B	ENVS1301 Environmental life science or ENVS14- 11 Blue planet or BIOL1309 Evolutionary diversity sem Demonstrate thorough grasp of the subject. Show strong a evidence of original thought. Apply highly effective lab / fieldword draw appropriate and insightful conclusions. Apply highly effective lab / fieldwork skills and techniques. Correct use of effective lab / fieldwork skills and techniques. Correct use of effective organizational and presentational skills. Demonstrate general but incomplete grasp of the subject. Evidence of and results to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and techniques to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and techniques to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and techniques to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and techniques. Limited ability to use data and results to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and techniques. Limited ability to use data and results to draw	Examination Exami	No Exam No Exam Ind logical thinking, with see of data and results the search of the			
and Co-requisites and mpermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	Pass in EASC140 Y 1st Y A+ to F A B C D	ENVS1301 Environmental life science or ENVS14- D1 Blue planet or BIOL1309 Evolutionary diversity sem Demonstrate thorough grasp of the subject. Show strong a evidence of original thought. Apply highly effective lab / fieldwordraw appropriate and insightful conclusions. Apply highly effective lab / fieldwork skills and techniques. Correct use of effective lab / fieldwork skills and techniques. Correct use of effective organizational and presentational skills. Demonstrate general but incomplete grasp of the subject. Evidence of and results to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and technique and results to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and techniques. Limited ability to use data and results to draw organizational and presentational skills. Demonstrate evidence of little or no grasp of the knowledge and analytical and critical abilities, logical and coherent thinking. Agand techniques. Misuse of data and results and/or unable	Examination Exami	No Exam No Exam Ind logical thinking, with see of data and results the search of the			
and Co-requisites and mpermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	Pass in EASC140 Y 1st Y A+ to F A B C D	ENVS1301 Environmental life science or ENVS14- D1 Blue planet or BIOL1309 Evolutionary diversity Sem Demonstrate thorough grasp of the subject. Show strong a evidence of original thought. Apply highly effective lab / fieldwordraw appropriate and insightful conclusions. Apply highly effective Demonstrate substantial grasp of the subject. Evidence of an effective lab / fieldwork skills and techniques. Correct use of effective organizational and presentational skills. Demonstrate general but incomplete grasp of the subject. Evidence of an effective lab / fieldwork skills and techniking. Apply moderately effective lab / fieldwork skills and teand results to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and teand results to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and teand results to draw appropriate conclusions. Apply moderately effective ab / fieldwork skills and teand results to draw organizational and presentational skills. Demonstrate evidence of little or no grasp of the knowledge and analytical and critical abilities, logical and coherent thinking. Af and techniques. Misuse of data and results and/or unability presentational skills are minimally effective or ineffective.	Examination Exami	No Exam No Exam Ind logical thinking, with see of data and results the search of the			
Course Type Course Teaching	Pass in EASC14C Y 1st Y A+ to F A B C D Fail	ENVS1301 Environmental life science or ENVS14- D1 Blue planet or BIOL1309 Evolutionary diversity Sem Demonstrate thorough grasp of the subject. Show strong a evidence of original thought. Apply highly effective lab / fieldwordraw appropriate and insightful conclusions. Apply highly effective lab / fieldwork skills and techniques. Correct use of effective lab / fieldwork skills and techniques. Correct use of effective organizational and presentational skills. Demonstrate general but incomplete grasp of the subject. Evidence of an effective lab / fieldwork skills and techniques. Apply moderately effective lab / fieldwork skills and tender and results to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and tender and logical thinking, but with limited analytical and critical ability to use data and results to draw organizational and presentational skills. Demonstrate evidence of little or no grasp of the knowledge and analytical and critical abilities, logical and coherent thinking. Agand techniques. Misuse of data and results and/or unable presentational skills are minimally effective or ineffective. The planet of the subject. Show strong a evidence of little or no grasp of the knowledge and analytical and critical abilities, logical and coherent thinking. Agand techniques. Misuse of data and results and/or unable presentational skills are minimally effective or ineffective. The planet of the subject. Show strong a evidence or entitled or experimental skills are minimally effective or ineffective.	Examination Exami	No Exam No Exam Indexidual logical thinking, with see of data and results the seed of th			
and Co-requisites and mpermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in EASC14C Y 1st Y A+ to F A B C D Fail Laborator	ENVS1301 Environmental life science or ENVS14- It Blue planet or BIOL1309 Evolutionary diversity Sem Demonstrate thorough grasp of the subject. Show strong a evidence of original thought. Apply highly effective lab / fieldword draw appropriate and insightful conclusions. Apply highly effective lab / fieldwork skills and techniques. Correct use of effective lab / fieldwork skills and techniques. Correct use of effective organizational and presentational skills. Demonstrate general but incomplete grasp of the subject. Evidence of and results to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and teand results to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and teand results to draw appropriate conclusions. Apply moderately effective lab / fieldwork skills and teand results to draw organizational and presentational skills. Demonstrate partial but limited grasp, with retention of some coherent and logical thinking, but with limited analytical and critical abilities, logical and coherent thinking. Affective and techniques. Misuse of data and results and/or unable presentational skills are minimally effective or ineffective. Py and workshop course Septimental planet or BIOL 1309 Evolutionary diversity of the subject. Evidence of the s	Examination Exami	No Exam No Exam Ind logical thinking, with see of data and results the search of the			

	Tutorials			12
	Reading / Self study			60
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		10	CLO 1,2,3
	Laboratory reports		20	CLO 1,2,3,4
	Presentation		20	CLO 2,3
	Project reports		50	CLO 1,2,3,4
Course Website	http://www.biosch.hku	ı.hk/ecology/lsc/		

ENVS2002 Environmental	data analy	rsis (6 credits)	Academic Year	2015			
Offering Department	Biologica	Sciences	Quota	50			
Course Co-ordinator	Dr T C B	Dr T C Bonebrake, Biological Sciences (tbone@hku.hk)					
Teachers Involved	Dr T C Bo	Or T C Bonebrake, School of Biological Science					
Course Objectives	questions display, t variety o	To provide students with the ability to analyze data; especially data which are relevant to issues a questions in environmental science. This course will enable students to accurately interpret, organ display, test and analyze environmental data. The course will also introduce students to principles of variety of important advanced approaches in analyzing environmental data including spatial analy geographic information systems, remote sensing, risk assessment, and time series analysis.					
Course Contents & Topics	hypothes qualities will be a oceanogr Statistica	The course will feature lectures on aspects of sampling, distributions, uncertainty, probability, ypothesis testing in addition to lectures on advanced analysis topics. Special emphasis will be place ualities inherent to most environmental datasets such as large size, multivariate, and spatial. All may will be applied and practiced in environmental science contexts (e.g. chemistry, ecology, geology ceanography) using a variety of datasets in a computer laboratory setting using the 'R Project statistical Computing' software (a graphical user interface will be implemented such that prior knowled oding or computer science is not required).					
Course Learning Outcomes	On succe	ssful completion of this course, students should be	e able to:				
	CLO 1	accurately interpret methods and approaches in	the scientific literature				
	CLO 2	evaluate critically data analyses in the environment	ental sciences				
	CLO 3	perform standard and appropriate statistical ana	yses on a variety of data source	es			
	CLO 4	work comfortably with large datasets using appli	ed software (e.g. R)	oftware (e.g. R)			
	CLO 5	present results of data analyses in a clear and tr	ansparent manner				
Pre-requisites (and Co-requisites and Impermissible combinations)		ENVS1301 Environmental life science or ENVS 11 Blue planet or BIOL1309 Evolutionary diversity		mental science o			
Offer in 2015 - 2016	Y 2n	d sem	Examination	May			
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough grasp of the subject and skills restrong analytical and critical abilities and logical thinking computational skills and techniques for basic statistical at draw appropriate and insightful conclusions. Apply high	, with evidence of original thought. Apparailyses. Be able to critically use data	oply a highly effective and statistical results			
	В	B Demonstrate substantial grasp of the subject and skills required for attaining at least most of the cour outcomes. Present evidence of analytical and critical abilities and logical thinking. Apply effective compute and techniques for basic statistical analyses. Be able to correctly use data and statistical results to draw 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 lear outcomes. Present evidence of some analytical and critical abilities and logical thinking. Apply moderately effectomputational skills and techniques for basic statistical analyses. Demonstrate mostly correct but some errone use of data and statistical results to draw appropriate conclusions. Apply moderately effective organizational presentational skills.					
	D Demonstrate partial and limited grasp of the subject and skills required for attaining some of the co outcomes. Present evidence of some analytical and critical abilities and logical thinking, but with limited critical abilities. Apply limited or barely effective computational skills and techniques for basic statistic Demonstrate limited ability to use data and statistical results to draw appropriate conclusions. Apply limited to the organizational and presentational skills.						
	Fail	Demonstrate limited or no grasp of the subject and skills Present evidence of little or lack of analytical and crit effective or ineffective computational skills and technique and statistical results and/or unable to draw appropr organizational and presentational skills.	cal abilities, logical or coherent thinks for basic statistical analyses. Demor	king. Apply minimally strate misuse of data			
Course Type	Lecture v	rith laboratory component course					
Course Teaching	Activitie	s Details		No. of Hours			
& Learning Activities	Lectures			24			
	Laborato	problem	-based learning/computer	24			
		laborate	'i y				

	Reading / Self s	tudy		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Examination		25	CLO 1,2,3
	Project report		25	CLO 1,2,3,4,5
	Test	problem-based exercises	50	CLO 1,2,3,4,5
Required/recommended reading and online materials	New York. Reimann, C. et a Wiley & Sons, Cl References:	012. Biostatistics with R: An Intro al. 2007. Statistical Data Analysis nichester. Fundamentals of Environmental S	Explained: Applied Environm	nental Statistics with R. John
Course Website	http://www.bioscl	h.hku.hk/ecology/lsc/		

ENVS3019 Urban ecology ((6 credits)			Academic Year	2015			
Offering Department	Biological	Sciences	Quota	50				
Course Co-ordinator	Dr T C Bo	or T C Bonebrake, Biological Sciences (tbone @hku.hk)						
Teachers Involved	Dr T C Bo	Or T C Bonebrake, School of Biological Science						
Course Objectives	ecosyster	This course will provide students with an understanding and knowledge of the ecology of urbaccosystems. The course will highlight the role of cities in a world under environmental change and rapalevelopment.						
Course Contents & Topics	Ecologica conservat change (e	Ecological systems within cities and cities as ecological systems will both be covered in this cour Ecological concepts unique to or specialized within cities will be covered including sustainabil conservation, health, development, globalization, and restoration. Specific topics will include clim change (e.g. urban heat island effects), invasive species, infectious diseases and pollution. Examples be taken globally but special emphasis will be placed on Hong Kong.						
Course Learning Outcomes	On succe	ssful completion of this co	ourse, students should	d be able to:				
	CLO 1	lescribe and evaluate the	processes and patter	rns that characterize urban ecolo	gical systems			
		Inderstand biodiversity ar	·		,			
	CLO 3 r		vithin urban ecosyste	ems and how energy use and	waste improve or			
	CLO 4	CLO 4 critically evaluate management and policy solutions to urban ecological problems						
Pre-requisites (and Co-requisites and Impermissible combinations)		ENVS2001 Environmenta Ecology and evolution	al field and lab cours	se or ENVS2002 Environmenta	l data analysis d			
Offer in 2015 - 2016	Y 1st	sem		Examination	Dec			
Offer in 2016 - 2017	N			'				
Course Grade	A+ to F							
Grade Descriptors	A	course learning outcomes. thought, ability to integrate	I of extensive knowledge and skills red d critical abilities and logical thinking, wit n, and ability to apply knowledge to a w we presentational skills. Strong evidence	h evidence of original				
	course learning outcomes. Show evidence of			pad range of knowledge and skills required for attaining at least most of the coor of analytical and critical abilities and logical thinking, integration of the coordinate and some unfamiliar situations. Demonstrate effectivation to thoughtful and reflective thinking.				
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and knowledge to most familiar situations. Apply moderately effective presentational skills. Little evid attention to thoughtful and reflective thinking.						
	D			e and skills required for attaining some cal thinking, but with limited analytical ar				
			Show limited ability to app	ly knowledge to solve problems. Apply li				
	Fail	little attempt at integration. presentational skills. Lack of Demonstrate little or no evoutcomes. Lack of analytical	Show limited ability to app f attention to thoughtful and idence of command of kn all and critical abilities, logic	ly knowledge to solve problems. Apply li	mited effectiveness in g the course learning e or no ability to apply			
Course Type	Fail	little attempt at integration. presentational skills. Lack of Demonstrate little or no evoutcomes. Lack of analytical	Show limited ability to app f attention to thoughtful and idence of command of kn all and critical abilities, logic	ly knowledge to solve problems. Apply lide reflective thinking. owledge and skills required for attaining and coherent thinking. Show very little	mited effectiveness in g the course learning e or no ability to apply			
Course Teaching	Fail	little attempt at integration. presentational skills. Lack of Demonstrate little or no ev outcomes. Lack of analytica knowledge to solve problem ased course	Show limited ability to app f attention to thoughtful and idence of command of kn all and critical abilities, logic	ly knowledge to solve problems. Apply li I reflective thinking. owledge and skills required for attainin al and coherent thinking. Show very littl tational skills are minimally effective or in	mited effectiveness in g the course learning e or no ability to apply			
Course Teaching	Fail Lecture-b	little attempt at integration. presentational skills. Lack of Demonstrate little or no ev outcomes. Lack of analytica knowledge to solve problem ased course	Show limited ability to app f attention to thoughtful and idence of command of kn all and critical abilities, logic s. Organization and preser	ly knowledge to solve problems. Apply li I reflective thinking. owledge and skills required for attainin al and coherent thinking. Show very littl tational skills are minimally effective or in	mited effectiveness in g the course learning or no ability to apply neffective.			
Course Teaching	Fail Lecture-b	little attempt at integration. presentational skills. Lack of Demonstrate little or no ev outcomes. Lack of analytica knowledge to solve problem ased course	Show limited ability to app f attention to thoughtful and idence of command of kn all and critical abilities, logic s. Organization and preser	ly knowledge to solve problems. Apply li I reflective thinking. owledge and skills required for attainin al and coherent thinking. Show very littl tational skills are minimally effective or in	mited effectiveness in g the course learning e or no ability to apply neffective.			
Course Type Course Teaching & Learning Activities	Fail Lecture-b Activitie Lectures Tutorials	little attempt at integration. presentational skills. Lack of Demonstrate little or no evoutcomes. Lack of analytica knowledge to solve problem ased course	Show limited ability to app f attention to thoughtful and idence of command of kn all and critical abilities, logic s. Organization and preser	ly knowledge to solve problems. Apply li I reflective thinking. owledge and skills required for attainin al and coherent thinking. Show very littl tational skills are minimally effective or in	mited effectiveness in g the course learning or no ability to apply effective. No. of Hours			

Assessment Methods and Weighting			Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Examination	Mid-term exam (20%), Final exam (30%)	50	CLO 1,2,3,4			
	Presentation		20	CLO 1,2,3,4			
	Project reports		30	CLO 1,2,3,4			
Required/recommended reading and online materials	Processes, and Ap	te JH, Elmqvist T, Guntenspergen oplications. Oxford University Press, Curban ecology. Cambridge University	Oxford.) Urban Ecology: Patterns,			
Course Website	http://www.biosch.	hku.hk/ecology/lsc/					
Additional Course Information		This course will be offered subject to a minimum enrollment number and availability of teachers. This course will be offered in alternative year.					

ENVS4110 Environmental r		<u> </u>	Academic Year	2015						
Offering Department	Biologica	Biological Sciences Quota 36								
Course Co-ordinator	Dr J D G	Or J D Gu, Biological Sciences (jdgu@hku.hk)								
Teachers Involved	Dr J D Gu	Or J D Gu, Biological Sciences								
Course Objectives	environm To under and the c To learn t	o introduce students with the environmental fate information of different pollutants/contaminants invironment of understand the technologies available for environmental remediation of pollutants in soils and wind the characteristics of each techniques relevant to the pollutants of concern to learn the fundamental physical, chemical and biochemical reactions involved in the remediation proposed application obtain skills for critical analysis of the recent technological development and the proposed application								
Course Contents & Topics	and aqua treatment polychlori biochemic degradati survival	Understanding the types of different pollutants and their fate in the environments including bo and aquatic; and relevant strategy of pollution control and treatment; advanced oxidation, mid treatment and phytoremediation; mechanisms of biochemical transformation of polyaromatic high polychlorinated biphenols, agrichemicals and phthalate esters as well as both metals and biochemical pathways and the specific genes involved in detoxification; chemotaxis and engular degradation pathways in bacteria; transport of microorganisms and monitoring in subsurface esurvival of introduced organisms; evolution of the degradative genes in bacteria; in situatemediation techniques; green technologies.								
Course Learning Outcomes	On succe	ssful completion of this course, students should be able	to:							
	CLO 1 explain the remediation technologies available to the type of pollutants of concern in remediation practice									
	CLO 2 propose remediation strategies for polluted sites with the best technologies available considering the type of pollutants and the cost involved									
	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 used in environmental remediation with adequate background information on their history and development									
Pre-requisites (and Co-requisites and Impermissible combinations)		BIOL3109 Environmental microbiology or BIOL3110 r biology or ENVS3042 Pollution	Environmental toxicoloç	gy or BIOL340°						
Offer in 2015 - 2016	Y 2nd	d sem	Examination	May						
Offer in 2016 - 2017	N		'							
Course Grade	A+ to F									
Grade Descriptors	A	Thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the cours learning outcomes. Thorough grasp of the subject matter. Show very strong analytical and critical abilities and hig logical thinking, with evidence of original thought. Apply highly effective lab skills and techniques. Critical use of da and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentation skills.								
	В	learning outcomes. Substantial grasp of the subject. Show evidence	pe of knowledge and skills required for attaining at least most of the cours of the subject. Show evidence of analytical and critical abilities and logicatechniques. Correct use of data of results to draw appropriate conclusions entational 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 loging thinking. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of data are results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.									
	D	Partial but limited command of knowledge and skills required for Partial but limited grasp, with retention of some relevant information logical thinking, but with limited analytical and critical abilities. Pability to use data and results to draw appropriate conclusions. Appresentational skills.	on, of the subject. Evidence of artially effective lab skills and	some coherent and techniques. Limited						
	Fail	l l								

Course Type	Lecture with laborato	ecture with laboratory component course						
Course Teaching	Activities			s	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		Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments			10	CLO 1,2,3,4			
	Examination			50	CLO 1,2,3,4			
	Laboratory reports			25	CLO 1,2,3,4			
	Presentation			10	CLO 1,2,3,4			
	Test			5	CLO 1,2,3,4			
Required/recommended reading and online materials	S.C. McCutcheon &		mediation: Tra	Press, 2nd edition) nsformation and Control -Blackwell, 2nd edition)	of Contaminants (Wiley)			
Course Website	http://moodle.hku.hk/	1						
Additional Course Information		e course will be offered subject to a minimum enrollment number and availability of teachers. is course will be offered in alternative year.						

ENVS4955 Environmental	science in	practice (6 credits)	Academic Year	2015				
Offering Department	Biological S	Biological Sciences Quota 18						
Course Co-ordinator	Dr M Yasuhara, Biological Sciences (yasuhara@hku.hk)							
Teachers Involved	Dr M Yasuh	nara, Biological Science						
Course Objectives	primarily bathesis style	students experiential learning experience in the field of ased on an array of field studies covering essential are a report on environmental science topic. Invited guests may be held.	as of environmental s	science as well as				
Course Contents & Topics		attend a series of field studies in, and/or outside, Hong budies may include:	Kong throughout the fire	nal academic year				
	core sampl geology/pal (2) Natural Department farms, Mai	ntial field trip, for example, to Japan (that may include ling, practical learning of ecological, paleoecology and leontology field trip, and other tours and activities); I resource management and conservation: visiting At, Fish Marketing Organization, local fisheries organizat Po RAMSAR Site, Hong Kong Wetland Park, Hong Kong tre, and Marine Parks and Reserves;	environmental proble griculture, Fisheries ions, agriculture/aqua	ms, environmenta and Conservation culture/mariculture				
Course Learning Outcomes	(3) Environ strategic la research ar Technology (4) Environ activities, in In addition, topics will b	Imental science and technologies: visiting water treatmandfill sites, power plants, Environmental Management and development of green technology), Centre for Marine (r), immental Lab: visiting Environmental Science and other terviewing PI, postdocs, post-graduate students, and writh the course includes thesis style report on an environme provided. Alternatively, students may propose their ownsful completion of this course, students should be able to:	nt Division of Product Environmental Resea or Pl's laboratory, lool ting a short article on tental science topic. To topic.	tivity Council (for rch and Innovative king into researce the Lab.				
Course Learning Outcomes	(3) Environ strategic la research ar Technology (4) Environ activities, in In addition, topics will b On success	andfill sites, power plants, Environmental Management development of green technology), Centre for Marine (; amental Lab: visiting Environmental Science and other interviewing PI, postdocs, post-graduate students, and writh the course includes thesis style report on an environment provided. Alternatively, students may propose their own	nt Division of Product Environmental Resea or Pl's laboratory, lool ting a short article on tental science topic. To topic.	tivity Council (for rch and Innovative king into researce the Lab.				
Course Learning Outcomes	(3) Environ strategic la research ar Technology (4) Environ activities, in In addition, topics will b	andfill sites, power plants, Environmental Management development of green technology), Centre for Marine (r), immental Lab: visiting Environmental Science and other interviewing PI, postdocs, post-graduate students, and writh the course includes thesis style report on an environmel provided. Alternatively, students may propose their own sful completion of this course, students should be able to:	nt Division of Product Environmental Resea or Pl's laboratory, lool iting a short article on mental science topic. To n topic.	tivity Council (for rch and Innovative king into researd the Lab.				
Course Learning Outcomes	(3) Environ strategic la research ar Technology (4) Environ activities, in In addition, topics will b On success	andfill sites, power plants, Environmental Management development of green technology), Centre for Marine (); Immental Lab: visiting Environmental Science and other interviewing PI, postdocs, post-graduate students, and writh the course includes thesis style report on an environmental completion of this course, students may propose their own sful completion of this course, students should be able to: recognize ways of environmental science in practice	nt Division of Product Environmental Resea or Pl's laboratory, lool iting a short article on mental science topic. To n topic.	tivity Council (for rch and Innovative king into research the Lab.				
Course Learning Outcomes Pre-requisites (and Co-requisites and (mpermissible combinations)	(3) Environ strategic la research ar Technology (4) Environ activities, in In addition, topics will b On success CLO 1 CLO 2 CLO 3 Pass in at le Science Ma This capsto	andfill sites, power plants, Environmental Management development of green technology), Centre for Marine (); immental Lab: visiting Environmental Science and other interviewing PI, postdocs, post-graduate students, and writh the course includes thesis style report on an environmental completion of this course, students may propose their own sful completion of this course, students should be able to: recognize ways of environmental science in practice gain knowledge of current environmental problems and present and communicate their field observations and file east 24 credits of advanced level (level 3 or 4) disciplinar	nt Division of Product Environmental Reseator Pl's laboratory, lool liting a short article on the ental science topic. The topic. solutions Indings I	tivity Council (forch and Innovative king into research the Lab.				
Pre-requisites (and Co-requisites and mpermissible combinations)	(3) Environ strategic la research ar Technology (4) Environ activities, in In addition, topics will b On success CLO 1 CLO 2 CLO 3 Pass in at le Science Ma This capsto	andfill sites, power plants, Environmental Management development of green technology), Centre for Marine (); Immental Lab: visiting Environmental Science and other interviewing PI, postdocs, post-graduate students, and write course includes thesis style report on an environmental completion of this course, students may propose their own sful completion of this course, students should be able to: recognize ways of environmental science in practice gain knowledge of current environmental problems and present and communicate their field observations and file east 24 credits of advanced level (level 3 or 4) disciplinar ajor. In that a student is allowed to take this capstone course is	nt Division of Product Environmental Reseator Pl's laboratory, lool liting a short article on the ental science topic. The topic. solutions Indings I	tivity Council (forch and Innovative king into research the Lab.				
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2015 - 2016	(3) Environ strategic la research ar Technology (4) Environ activities, in In addition, topics will b On success CLO 1 CLO 2 CLO 3 Pass in at le Science Ma This capsto The earliest	andfill sites, power plants, Environmental Management development of green technology), Centre for Marine (); Immental Lab: visiting Environmental Science and other interviewing PI, postdocs, post-graduate students, and write course includes thesis style report on an environmental completion of this course, students may propose their own sful completion of this course, students should be able to: recognize ways of environmental science in practice gain knowledge of current environmental problems and present and communicate their field observations and file east 24 credits of advanced level (level 3 or 4) disciplinar ajor. In that a student is allowed to take this capstone course is	nt Division of Product Environmental Resear Pl's laboratory, lool iting a short article on the state of the s	tivity Council (for ch and Innovative king into research the Lab. The list of potentials in Environmentals				
Pre-requisites (and Co-requisites and	(3) Environ strategic la research ar Technology (4) Environ activities, in In addition, topics will b On success CLO 1 CLO 2 CLO 3 Pass in at le Science Ma This capsto The earliest Y Year	andfill sites, power plants, Environmental Management development of green technology), Centre for Marine (); Immental Lab: visiting Environmental Science and other interviewing PI, postdocs, post-graduate students, and write course includes thesis style report on an environmental completion of this course, students may propose their own sful completion of this course, students should be able to: recognize ways of environmental science in practice gain knowledge of current environmental problems and present and communicate their field observations and file east 24 credits of advanced level (level 3 or 4) disciplinar ajor. In that a student is allowed to take this capstone course is	nt Division of Product Environmental Resear Pl's laboratory, lool iting a short article on the state of the s	tivity Council (forch and Innovative king into research the Lab. The list of potentials in Environmentals				

	effe	B Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical effective lab / fieldwork skills and techniques. Correct use of data of results to draw appropriate coreffective organizational and presentational skills.							
	think	Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and log thinking. Apply moderately effective lab / fieldwork skills and techniques. Mostly correct but some erroneous use of d and results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.							
	cohe	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.							
	of a	Demonstrate evidence of little or no grasp of the knowledge and understanding of the subject. E of analytical and critical abilities, logical and coherent thinking. Apply minimally effective or ine skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusi presentational skills are minimally effective or ineffective.						ineffective lab / fieldwork	
Course Type	Laboratory and	worksh	nop course						
Course Teaching	Activities	Activities			Details			No. of Hours	
& Learning Activities	Field work	Field work			Field work and other learning students will take part in at least 66 hours of field trips and other learning 66 hours			66	
	Reading / Self	Reading / Self study						100	
Assessment Methods and Weighting	Methods		Details			Weighting in final course grade (%)	As	sessment Methods to CLO Mapping	
	Laboratory rep	orts	field reports			30		CLO 1,2,3	
	Presentation		group presentations			30		CLO 1,2,3	
	Project reports		individual report			40		CLO 1,2,3	
Course Website	http://www.bioso	ch.hku.	.hk/ecology/lsc/						
Additional Course Information	own travel cost (please contact	tp://www.biosch.hku.hk/ecology/lsc/ ome trips will be organized in reading weeks, and others in weekends. Students will need to pay for their wn travel cost for the residential field trip. lease contact us for details and financial difficulty). his course will be offered subject to a minimum enrollment number and availability of teachers.							

CAES1000 Core Univers	ity English	ı (6 cre	dits)			Academic Year	2016		
Offering Department	English					Quota			
Course Co-ordinator	Dr N Fong	N Fong, English (fongsn@hku.hk)							
Teachers Involved	Dr N Fong	g, Centre	for Applied English Studies						
Course Objectives									
Course Contents & Topics	proficiency for the Co spoken as manner a also comp vocabular students t	The Core University English (CUE) course aims to enhance first-year students' academic English language of conficiency in the university context. CUE focuses on developing students' academic English language of the Common Core Curriculum. These include the language skills needed to understand and production and written academic texts, express academic ideas and concepts clearly and in a well-structure anner and search for and use academic sources of information in their writing and speaking. Students of complete four online-learning modules through the Moodle platform on academic grammar, acade cabulary, citation and referencing skills and understanding and avoiding plagiarism. This course will be udents to participate more effectively in their first-year university studies in English, thereby enriching the st-year experience.							
Course Learning Outcomes	On succes	ssful com	npletion of this course, stude	nts shou	ıld be able to:				
			nd distinguish between mair ate an understanding of the				written texts a		
	CLO 2 fe	orm and	express personal opinions tl	nrough c	ritical reading and lis	stening			
		•	and defend a position in a d speaking	a clear a	and structured way	using academic	sources, throu		
	CLO 4	lemonstra	ate control of grammatical a	ccuracy	and lexical appropri	acy in academic c	ommunication		
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL								
Offer in 2016 - 2017	Y 1st	sem 2ı	nd sem			Examination	Dec Ma		
Offer in 2017 - 2018	Υ								
Course Grade	A+ to F								
	В	Excellent to outstanding result. Students are able to produce spoken and written academic texts which are at all tim appropriately structured. Students can clearly and concisely explain academic concepts and critically argue for a detail position. Students always use appropriate academic sources to support their ideas in writing and speaking. They c and reference correctly at all times. Students demonstrate an ability to fully comprehend and critically interpret spok and written texts. Written language contains very few, if any, systematic errors in grammar and vocabulary. Spok language is always comprehensible and fluent. Good to very good result. Students are able to produce spoken and written academic texts which are appropriate structured with only minor errors. Students can almost always clearly and concisely explain academic concepts a almost always critically argue for a detailed position. Students almost always use appropriate academic sources support their ideas in writing and speaking. They cite and reference correctly with only a few non-systematic error Students can comprehend and interpret texts with ease, although they may miss some implied meanings and opinior Written language is mostly comprehensible and fluent.							
	C D	structured but there is some evidence of this ability. Students are sometimes unable to clearly and concisely explain academic concepts. While they can argue for a position, it is not very detailed and tend to be simplistic rather than critical. Students sometimes use sources which are nonacademic and/or not appropriate to support their ideas in writing and speaking. There are some systematic errors in citation and referencing but also evidence of correct systematic use. Students have some difficulty comprehending and critically interpreting texts. They can always understand the main ideas but may miss some of the writer's views and attitudes. Written language is sometimes inaccurate, although errors, when they occur, are more often in complex grammar and vocabulary and there is some evidence of control of simple grammatical structures. Spoken language is generally comprehensible and fluent but at times places strain on the listener.							
	Fail	argue for a position. Students often use sources which are nonacademic and/or not appropriate to support their ideas writing and speaking. There are many systematic errors in citation and referencing however there is evidence of a understanding of some of the conventions of citation and referencing. Students often have difficulty comprehending ar interpreting texts, sometimes failing to understand the main ideas and writer's views and attitudes. Written language often inaccurate containing errors in a range of simple and complex grammar and vocabulary. Spoken language is on sometimes comprehensible and fluent, and strain is frequently placed on the listener. Fail Unsatisfactory result. Productive skills are too limited to be able to successfully carry out spoken and writte assessments. Texts are unstructured and unclear. Students are unable to follow and interpret texts. There are language.							
Course Turns	1	attempt	n almost every sentence. Spoke ed or contain plagiarism.	ıı ıanguag	je is oπen incompreher	ISIDIE. ASSESSMENTS	may not have b		
Course Type	Lecture-ba		156						
Course Teaching & Learning Activities	Activities Lectures	S		D	etails		No. of Hou		
	Tutorials								
	Reading	/ Self stu	dy						
Assessment Methods	Methods		Details		Weighting in fina	al Asses			
and Weighting					course grade (%		sment Metho o CLO Mappi		
	Assignme	ents			course grade (%				

CAES9820 Academic Engli	sh for sc	ience s	tudents (6 credits)	1	Academic Year	2016		
Offering Department	English			C	Quota			
Course Co-ordinator	Ms E Lav	E Law, English (ellielaw@hku.hk)						
Teachers Involved	Ms E Lav	E Law, Centre for Applied English Studies						
Course Objectives	Science English v and scien emphasis	his six credit English-in-the-Discipline course will be offered to second year students studying in cience Faculty. This course will help students develop the necessary skills to use both written and springlish within their studies. Students will learn to better communicate and spontaneously discuss gered scientific concepts within their division, with other scientists as well as to a larger audience. Participles will be placed on enabling students to identify their own language needs and develop appropelf-learning strategies to improve their proficiency.						
Course Contents & Topics	FindingCompiliContrasWritingOrganizgrammarCriticall	popics covered in the course will be: 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 ar ammar; and Critically examine their own language proficiency and analyze how that relates to their ability to perfor accessfully within their discipline. Developing self-directed learning strategies.						
Course Learning Outcomes	On succe	essful co	mpletion of this course, students	s should be able to:				
	CLO 1	identify a	and summarize disciplinary sour	ces related to a specifi	ed topic			
		•	texts (written and spoken) appary knowledge	propriate for a cross-dis	sciplinary audien	ce based on thei		
	CLO 3	identify t	heir own language learning nee	ds and implement a pla	an to meet those	needs		
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL							
Offer in 2016 - 2017	Y 1s	t sem 2	2nd sem	E	Examination	No Exam		
Offer in 2017 - 2018	Υ			'				
Course Grade	A+ to F							
Grade Descriptors	В	reliable sources using original language. Text uses sources appropriately and demonstrates accurate appropriate grammatical, lexical and organizational characteristics. Language learning needs are clearly iden and aligned with evidence of planning, self-study and reflection.						
		lexical and organizational characteristics. Language learning needs are stated with some reference to e 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 mos						
	language although some inaccuracies are present. Text uses some sources appropriately and c appropriate but simple grammatical and lexical characteristics with some organizational flaws. Langu needs are stated with some limited evidence of planning and reflection but goals and self-study are misa					ly and demonstrate s. Language learning		
	D	and li inappr	satisfactory result. Demonstrates a lin ttle original language. Text uses s opriate lexical choices and organization organd reflection with little or no appare	sources inappropriately and onal flaws. There is a minin	d demonstrates gra	mmatical inaccuracy		
	Fail	paraph organi	sfactory result. Does not demonstrate trase reliable sources. Text uses a zational errors. Does not demonstration aplan.	no sources and demonstra	ates serious gramm	atical, lexical and/o		
Course Type	Lecture-b	pased co	urse					
Course Teaching	Activitie	es		Details		No. of Hours		
& Learning Activities	Tutorials	3		seminars		36		
	Reading	/ Self st	udy			120		
	Assessr	nent		independent learning	work	84		
Assessment Methods and Weighting	Method	s	Details	Weighting in fi		ssment Methods to CLO Mapping		
	Assignm	nents	independent learning work	352.55 9.446	20			
	Essay		other genres of writing		55			
	Test				25			
Required/recommended reading and online materials	Course n	naterials	to be provided electronically thr	rough course website.	ı			
Course Website	http://cae	s.hku.hk	/caes9820/					

Offering Department		ry (6 credits)	Academic Year	2015						
	Chemist	ry	Quota	156						
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 who do not have HKDSE Chemistry or an equivalent background by are interested in exploring Chemistry further, with an understanding of the essential fundamental principle and concepts of chemistry.									
Course Contents & Topics	Element propertie	Chemistry: Matter and Measurement (2 hours) s, compounds, and mixtures; physical properties of mass; measuring mass, length, volume and temperature; atomicept and stoichiometry; solutions and concentrations; unc	ic structure and subato	mic particles; th						
		Gases: Their Properties and Behaviour (6 hours) ssure; the gas laws; the ideal gas law and reaction stioch	iometry; the kinetic-mo	olecular theory						
	Covalen	Chemical Bonding and Structures (7 hours) t, ionic and metallic bonds; bond energy and chemical char ructures of molecules and ions; VSEPR Theory and molecu	0 ,	and bond polari						
	Physical state: st	Intermolecular Forces: Liquids, Solids, and Phase Change states and phase changes; types of intermolecular force tructure, properties, and bonding; advanced materials e. materials and polymeric materials.	es; properties of liquid							
	Topic 5: Chemical Equilibrium (4 hours) The equilibrium state and the equilibrium constant; the equilibrium law: calculation of equilibrium constants and reaction quotient; Le Chelier? Principle									
	Topic 6: Introductory Organic Chemistry (9 hours) Homologous series and nomenclature; isomerism; typical reactions of selected functional groups.									
Course Learning Outcomes	On successful completion of this course, students should be able to:									
	CLO 1	CLO 1 demonstrate knowledge and understanding in relation to some chemical vocabulary, terminology and conventions								
	CLO 2 demonstrate knowledge and understanding of chemical stoichiometry, the properties of liquids and solids, the nature of gases, phase changes, chemical bonding and structures, and the nature of chemical equilibria									
	CLO 3 demonstrate a basic knowledge of nomenclature, isomerism, and typical reactions of various functional groups of 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 a in everyday life	applications of chemist	ry in society an						
Pre-requisites (and Co-requisites and Impermissible combinations)	equivale Students course of	or above in HKDSE Combined Science with Chemistry nt. s without such background but keen on taking this foundati coordinator for consideration. students with Level 3 or above in HKDSE Chemistry.								
Offer in 2015 - 2016	Y 15	st sem	Examination	Dec						
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive ki course learning outcomes. Show thorough grasp of the subject. De and logical thinking, with ability to apply knowledge to a wide rang Apply highly effective organizational and presentational skills.	emonstrate strong analytical	and critical abilitie						
	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.									
		organizational and procentational oxino.		C 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.						
	С	Demonstrate general but incomplete command of knowledge and learning outcomes. Show general but incomplete grasp of the subject critical abilities and logical thinking, and ability to apply knowledge.	ct. Demonstrate evidence of	some analytical an						
	C	Demonstrate general but incomplete command of knowledge and learning outcomes. Show general but incomplete grasp of the subject critical abilities and logical thinking, and ability to apply knowledge.	ct. Demonstrate evidence of e to most familiar situation: equired for attaining some of elevant information, of the s lytical and critical abilities. S	some analytical an s. Apply moderate the course learnin ubject. Demonstrat how limited ability to						
		Demonstrate general but incomplete command of knowledge and learning outcomes. Show general but incomplete grasp of the subject critical abilities and logical thinking, and ability to apply knowledge effective organizational and presentational skills. Demonstrate partial but limited command of knowledge and skills reoutcomes. Show partial but limited grasp, with retention of some reevidence of some coherent and logical thinking, but with limited anal	ct. Demonstrate evidence of e to most familiar situation: equired for attaining some of elevant information, of the s lytical and critical abilities. S organizational and presentat skills required for attaining I understanding of the subje- no ability to apply knowledg	some analytical ar s. Apply moderate the course learnir ubject. Demonstrat how limited ability ional skills. the course learnir ct. Lack of analytic						

Course Teaching	Activities		Details	No. of Hours
& Learning Activities Assessment Methods and Weighting	Lectures			36
	Tutorials			12
	Reading / Self s	study		100
	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		20	CLO 1,2,3,4,5
	Examination		65	CLO 1,2,3,4,5,6
	Test		15	CLO 1,2,3,4,5,6
Required/recommended reading and online materials	edition, Pearson 2) Moore; Stanit	ring; Madura; Bissonnette: Gene ski; Jurs: Chemistry: The Molecu ndahl: Chemistry, latest edition, E	lar Science, latest edition, Bro	
Additional Course Information	Suggested follow	w-up course: CHEM1042 Genera	I Chemistry I	

CHEM1042 General chemis	ily i (o c	. • • • • • • • • • • • • • • • • • • •		2015			
Offering Department	Chemist	Chemistry Quota 318					
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 principles and concepts of chemistry. It also provides students with hands-on training of basic laboratory skills and technique including volumetric analysis, preparation, purification and characterization of chemical substances an some basic instrumental methods. Students will be equipped with a good foundation of theoretical an practical knowledge and skills for further studies in Chemistry.						
Course Contents & Topics	1. Chemistry: its nature and method Physical properties; chemical changes and chemical properties; elements and compounds; measuring mass, length, volume and temperature; atomic structure and subatomic particles; the mole concept and stoichiometry; solutions and concentrations; uncertainty in measurement and significant figures. 2. Atoms: the quantum world Electromagnetic radiation and matter; Planck's quantum theory; the Bohr model of the hydrogen atom; the quantum mechanical model of the atom; quantum numbers, energy levels, and atomic orbitals; shapes of atomic orbitals; electron configurations; periodic trends: atomic radii, ionic radii, ionization energies, and electron affinities. 3. Chemical bonding and structures Review on covalent, ionic and metallic bond. Covalent bonds and molecular structures (VSEPR, VB theory). 4. Energetics and kinetics of reactions Heat and work; the first law of thermodynamics; heat of reactions; spontaneity of changes. Reaction rate; factors that influence reaction rate; rate laws: differential and integrated rate laws; temperature and reaction rate; reaction mechanisms. 5. Acid-Base equilibria Acid-base concepts; equilibria in solutions of weak acids and in weak bases; ionization constants; molecular properties and acid strength; acid-base properties of salt solutions; buffer solutions; acid-base titrations.						
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1 demonstrate a basic knowledge and understanding of the microscopic nature of atomic structure and concepts of chemical bonding and their relationships with the bulk properties of matter						
	CLO 2 demonstrate knowledge and understanding in relation to thermodynamics and kinetics of reactions as well as aqueous equilibria including acid-base equilibria						
	CLO 3 apply the theories and concepts introduced in the course to solve problems, perform calculations, make predictions and rationalize trends						
	CLO 4 carry out chemical experiments with proper procedures, record experimental oberservations accurately, and interpret and evaluate the experimental data						
	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)		or above in HKDSE Chemistry or equivalent; stury but having a pass in CHEM1041 Foundations of cl					
Offer in 2015 - 2016	Y 15	st sem 2nd sem	Examination	Dec May			
Offer in 2016 - 2017	Υ		ı				
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of ext course learning outcomes. Show thorough grasp of the sut and logical thinking, with ability to apply knowledge to a wi Show highly effective lab skills and techniques. Apply highly	pject. Demonstrate strong analytica de range of complex, familiar and	I and critical abilitie unfamiliar situation			

	-	red for attaining at least most of the evidence of analytical and critical nfamiliar situations. Show effective				
	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.					
	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 presentational skills.					
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Show evidence of little or no grasp of the knowledge and understanding of the subject. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems. Demonstrate minimally effective or ineffective lab skills and techniques. Organization and presentational skills are minimally effective or ineffective.					
Course Type	Lecture with laboratory component course					
Course Teaching	Activities			Details	S	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				60	CLO 1,2,3,5,6
	Laboratory reports				25	CLO 1,2,3,4,5,6
	Test				15	CLO 1,2,3,5,6
Required/recommended reading and online materials	1) Petrucci; Herring; Madura; Bissonnette: General Chemistry: Principles and Modern Applications, latest edition, Pearson 2) Moore; Stanitski; Jurs: Chemistry: The Molecular Science, latest edition, Brookes/Cole 3) Zumdahl; Zumdahl: Chemistry, latest edition, Brookes/Cole					
Additional Course Information	Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports to pass this course.					

CHEM1043 General chemi	stry II (6	credits)	Academic Year	2015			
Offering Department	Chemistry Quota 180						
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 further consolidate some of the important fundamentals of chemistry that underlie many topics and principles across the physical sciences. The course prepares students to pursue a major in chemistry or in other aspects that require a good foundation in chemistry.						
Course Contents & Topics	Simple theory of 2. Struct Bonding 3. Solut Types of solubilit point ele 4. Solut Solubilit equilibri qualitati 5. Entro A quick Gibbs e 6. Elect Electros	good foundation in chemistry. 1. Gases Simple gas laws; ideal gas equation; gases in chemical reactions; mixture of gases; kinetic-moler theory of gases; diffusion and effusion; non-ideal gases. 2. Structure and Bonding: The Delocalized Approach: Molecular Orbital Theory Bonding in homonuclear and heteronuclear diatomic molecules of first and second period of elembonding in some simple polyatomic molecules; bonding in metals (band theory). 3. Solutions and their Properties Types of solutions; intermolecular forces and the solution process; solution formation and equilibr solubilities of gases; vapor pressures of solutions; osmotic pressure; freezing-point depression and bo point elevation of nonelectrolyte solutions; solutions of electrolytes; colloidal mixtures. 4. Solubility and Complex-lon Equilibria Solubility product constant; relationship between solubility and Ksp; common-ion effect in solu equilibria; limitations of the Ksp concept; precipitation; solubility and pH; equilibria involving complex qualitative cation analysis. 5. Entropy & Gibbs Energy A quick review on entropy and the second & third laws of thermodynamics. Standard Gibbs energy change and equilibrium; coupled reactions. 6. Electrochemistry Electrode potentials and their measurement; standard electrode potentials; Ecell, delta G, and K; Ecell functions of concentrations; batteries; corrosion; electrolysis; industrial electrolysis processes.					
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1 demonstrate a knowledge and understanding of the properties and behavior of gases and ap gas laws and kinetic-molecular theory to processes involving gases						
	CLO 2 demonstrate a knowledge and understanding in relation to solutions and their properties, solubility and complex-ion equilibria, and also electrochemistry						
	CLO 3						

			olecular orbital theory to explai second period of elements and				ic molecules of	
	CLO 4		trate a knowledge and underseity of reaction	standing of the rela	tionship be	etween fr	ee energy and	
	CLO 5		e theories and concepts introduced in the concepts and rationalize trends	ced in the course to s	olve proble	ms, perfo	rm calculations,	
	CLO 6	organize	and present chemical ideas in	a clear, logical and co	herent way	/		
	CLO 7	demons	trate awareness of the relevant	applications of chemis	stry in socie	ety and in	everyday life	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	Pass in CHEM1042 General chemistry I						
Offer in 2015 - 2016	Y 2	nd sem			Examinat	ion	May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F	A+ to F						
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning outcomes. Show thorough grasp of the subject. Demonstrate strong analytical and critical abilities and logical thinking, with 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 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	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the coulearning outcomes. Show general but incomplete grasp of the subject. Demonstrate evidence of some analytical critical abilities and logical thinking, and ability to apply knowledge to most familiar situations. Apply moderal effective organizational and presentational skills.					some analytical and	
	D Demonstrate partial but limited command outcomes. Show partial but limited grasp, evidence of some coherent and logical thir apply knowledge to solve problems. Apply			th retention of some releving, but with limited analytic	ant informational and critical	on, of the su abilities. Sh	ubject. Demonstrate now limited ability to	
	Fail	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course outcomes. Show evidence of little or no grasp of the knowledge and understanding of the subject. Lack of a and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve pr Organization and presentational skills are minimally effective or ineffective.					t. Lack of analytical	
Course Type	Lecture-	based co	ourse					
Course Teaching	Activit	ine		Details			No. of Hours	
& Learning Activities	Lecture			Details			36	
	Tutoria						12	
	1	g / Self st	tudy				100	
Assessment Methods								
and Weighting	Method	ds	Details	Weighting in course grade				
	Examin	ation		-	70	CLO 1,2	,3,4,5,6,7	
	Test		Test and assignment	30		CLO 1,2,3,4,5,6,7		
Required/recommended reading and online materials	1) Petrucci; Herring; Madura; Bissonnette: General Chemistry: Principles and Modern Applications, lates edition, Pearson 2) Moore; Stanitski; Jurs: Chemistry: The Molecular Science, latest edition, Brookes/Cole 3) Zumdahl; Zumdahl: Chemistry, latest edition, Brookes/Cole							

CHEM2041 Principles of o	chemistry (6 credits)	Academic Year	2015			
Offering Department	Chemistry	Quota	140			
Course Co-ordinator	Dr I K Chu, Chemistry (ivankchu@hku.hk)					
Teachers Involved	Dr A M Y Yuen, Chemistry Dr I K Chu, Chemistry					
Course Objectives	This course is designed for non-chemistry major students covering basic principles 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, he capacities, thermochemistry, Hess's Law, Kirchhoff's Law, the second and third laws of thermodynamic entropy, Gibbs free energy, spontaneity, equilibrium, coupled reaction; Transport Phenomena: diffusion, viscosity of gases, diffusion in liquids and viscosity of liquids, ior conduction; Chemical Kinetics: rate of reactions, orders of reactions, rate laws, reaction mechanism, experiment 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 rul chemical potential; liquid/liquid systems; Introduction to acids and bases: calculation on concentration of different chemical species in a solutio diprotic and polyprotic acids, activity; Introduction to Spectroscopy: UV/Visible absorption spectroscopy, Beer-Lambert Law; IR Spectroscop identification of functional groups; NMR Spectroscopy, Larmor frequency & chemical shift, peak integra					

	formulae.	ling multiplicities; Mass Spectr	,		S. Molocula	
Course Learning Outcomes	On successful of	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					
	CLO 2 explain	the principles of the spectroscop	by, and spectrometry			
Pre-requisites (and Co-requisites and Impermissible combinations)	Not for student course; and Not for student course; and Not for student have already er	Not for students who have passed in CHEM2441 Organic chemistry I or have already enrolled in this				
Offer in 2015 - 2016	N		E	Examination		
Offer in 2016 - 2017	Υ					
Course Grade	A+ to F					
Grade Descriptors	A Demonstrate thorough knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemistry, instrumentations and applications of spectrometry and spectroscopy for chemical analysis. Show strong ability to apply and integrate knowledge and theory, and strong ability to analyze problems related to general chemistry and spectroscopy.					
	B Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemistry, instrumentations and applications of spectrometry and spectroscopy for chemical analysis. Show evidence to apply and integrate knowledge and theory, and ability to analyze problems related to general chemistry and spectroscopy.					
	C Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemistry, instrumentations and applications of spectrometry and spectroscopy for chemical analysis. Show evidence of some abilities to apply and integrate knowledge and theory, and to analyze problems to most familiar situations to general chemistry and spectroscopy.					
	D Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemistry, instrumentations and applications of spectrometry and spectroscopy for chemical analysis. Show evidence of limited abilities to apply and integrate knowledge and theory, and limited ability to analyze problems to most familiar situations related to general chemistry and spectroscopy.					
	prin spe the	Fail Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles and theories relating to the modern chemistry, instrumentations and applications of spectrometry and spectroscopy for chemical analysis. Show little or no evidence of abilities to apply and integrate knowledge and theory, and little or no ability to analyze problems to most familiar situations related to general chemistry and spectroscopy.				
Course Type	Lecture-based	course				
Course Teaching	Activities	Activities			No. of Hours	
& Learning Activities	Lectures				36	
	Tutorials				12	
	Reading / Self	study			100	
Assessment Methods and Weighting	Methods	Details	Weighting in fin		ssment Methods to CLO Mapping	
	Assignments			25 C	LO 1,2	
	Examination			75 C	LO 1,2	
Required/recommended reading and online materials	Spectroscopy for	or the biological science, by Gord	on G. Hammes, Wiley-In	nterscience (2005	5)	

CHEM2241 Analytical che	mistry I (6 credits)	Academic Year	2015				
Offering Department	Chemistry Quota 115						
Course Co-ordinator	Dr W T Chan, Chemistry (wtchan@hku.hk; kwanmng@hku.hk)						
Teachers Involved	Dr W T Chan (1st sem), Chemistry Dr I K Chu (2nd sem), 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	Measurement: analog and digital measurement, accuracy and precision, comparing means and deviations, calibration curves and least square method for linear plots Quality assurance: validation of analytical procedures Chemical equilibrium and chemical analysis: aqueous solution and chemical equilibrium; analysis by acid-base reactivity, complexation reactivity, precipitation reactivity						
Course Learning Outcomes							

	On success	ful comple	tion of this course, stud	ents should	be able to:				
	CLO 1 ex	plain the b	asic principles of chemi-	cal measure	ements				
	CLO 2 ex	plain the p	rinciples of classical me	thods of che	emical analysis	s such as	acid-base	neutraliz	ation
	CLO 3 us	e laborato	ry apparatus for chemica	al analysis					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in CH	EM1042 G	eneral chemistry I (for s General chemistry I; and dents admitted in 2015-1	Pass in Ch	HEM1043 Gen			already e	enrolled
Offer in 2015 - 2016	Y 1st s	em 2nd	sem			Examina	tion	Dec	May
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	thinking, an highly profi	e thorough grasp of the sub d ablility to apply knowledge cient lab skills and technique . Demonstrate highly effective	to a wide rang es and critical	e of complex, fan use of data and	niliar and un results to	familiar situa	tions. Dem	onstrate
	В	evidence of Demonstrat	e substantial grasp of the s f independent thinking, and e proficient lab skills and tech e effective organization and p	ability to ap niques and co	ply knowledge to rrect use of data a	familiar a	nd some un	familiar si	uations.
	С								
	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 wit	n laborator	y component course						
Course Teaching	Activities			Detail	S			No. of	Hours
& Learning Activities	Lectures								24
	Laboratory								24
	Tutorials								6
	Reading /	Self study							100
Assessment Methods and Weighting	Methods		Details		Weighting course gra			ment Me	
	Assignme	nts			, ,	5		_0 1,2	
	Examination	on			65		C	_0 1,2	
	Laboratory	reports				20	CLO 3		
	Test					10	Cl	_O 1,2	
Required/recommended reading and online materials	Skoog, We Learning.	est, Holler	and Crouch, "Funda	mentals of	Analytical Cl	hemistry",	latest ed	lition, C	engage
Additional Course Information	Laboratory pass this co		re mandatory. Students	s must com	plete ALL exp	periments	and labor	atory rep	oorts to

CHEM2341 Inorganic cher	nistry I (6	6 credits)					Academic Year	2015	
Offering Department	Chemis	stry					Quota	115	
Course Co-ordinator	Prof V \	Prof V W W Yam (1st sem); Dr H Y Au Yeung (2nd sem), Chemistry (wwyam@hku.hk; hoyuay@hku							
Teachers Involved		V W W Yam / Dr H Y Au Yeung, Chemistry A M Y Yuen, Chemistry							
Course Objectives	relevan	To provide students with the basic principles and knowledge of inorganic chemistry and to introduce the relevance to biological processes and materials science. This course provides the foundation for furth studies in inorganic chemistry.							
Course Contents & Topics	electror redox a	nic absorpti and substitu	ion and magn	etic properties try of selecte	s of metal comp	plexes; che	exes and main gro mical reactions of n nd transition metal	netal complexes	
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1	CLO 1 understand the basic principles and concepts of inorganic chemistry and appreciate their relevance to selected examples of biological processes and materials science							
CLO 2 demonstrate knowledge and understanding of the acid-base concept an								n	

	C	ompounds a	knowledge and unand transition metal perties of transition r	complexes and	their relevanc		•		•
			knowledge and und the thermodynamic						mplex
			knowledge and und exes in bioinorganic of	-	the role of ma	in group	elements	and tra	nsition
Pre-requisites (and Co-requisites and Impermissible combinations)	of chemist Pass in Cl in this cou	ry or alread HEM1042 0 urse; and N	General chemistry I; a y enrolled in this cou General chemistry I; a OT for students who I (for students admitte	rse (for student and Pass in CH have passed	s admitted in 2 IEM1043 Gene in CHEM2041	014-15 o eral chem	r before); istry II or a	lready e	enrolled
Offer in 2015 - 2016	Y 1st	sem 2nd	sem			Examina	tion	Dec	May
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	the basic for bonding of a well as ther processes a basic found data and e knowledge	e thorough knowledge an oundation knowledge of in main group compounds at modynamic and kinetic at and materials science. Sl ation knowledge of inorga xperimental results to dro of inorganic chemistry of inorganic chemistry is and characterization of	organic chemistry, nd metal complexes spects of metal cor now strong ability the inic chemistry. Sho aw appropriate and emonstrate highly	especially those noise electronic absorption plexes and their to apply and integ to strong ability to dinsightful conclueffective basic laborations.	elated to ac otion spectr reactions; a rate knowle analyze no sions relationatory skill	cid-base cond oscopy, magind their relevedge and their vel problems ng to the ba	ept; struct netic prope ance to bi ory relating and critica sic princip	ture and erties as iological g to the all use of older
	В	theories rel concept; str magnetic prelevance t theory relat and correct knowledge	e substantial command of ating to the basic foundar ucture and bonding of mar operties as well as therm o biological processes a ing to the basic foundation use of data and experime of inorganic chemistry. End characterization of inor finor of inorganic of inorgani	ation knowledge of in group compoun- odynamic and kine nd materials scien in knowledge of inco antal results to draw demonstrate effecti	inorganic chemis ds and metal comp tic aspects of meta ce. Show evidence organic chemistry. It w appropriate conc ve basic laborator	try, especial complexes et al complexe et apply Show evide elusions relary skills and	ally those rel tronic absorp es and their re and integrate ence to analyzating to the ba	ated to action spectreactions; a knowled to novel place principals of the principal of the principals of the principals of the principals of the principals of the principal of the	cid-base roscopy, and their dge and roblems oles and
	Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of inorganic chemistry, especially those related to acid-base concept; structure and bonding of main group compounds and metal complexes; electronic absorption spectroscopy, magnetic properties as well as thermodynamic and kinetic aspects of metal complexes and their reactions; and their relevance to biological processes and materials science. Show evidence of some abilities to apply and integrate knowledge and theory relating to the basic 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 basic principles and knowledge of inorganic chemistry. Demonstrate moderately effective basic laboratory skills and techniques, especially in the synthesis and characterization of inorganic compounds and metal complexes.								
	D	Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of inorganic chemistry, especially those related to acid-base concept; structure and bonding of main group compounds and metal complexes; electronic absorption spectroscopy, magnetic properties as well as thermodynamic and kinetic aspects of metal complexes and their reactions; and their relevance to biological processes and materials science. Show evidence of limited abilities to apply and integrate knowledge and theory relating to the basic 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 basic principles and knowledge of inorganic chemistry. Demonstrate partially effective basic laboratory skills and techniques, especially in the synthesis and characterization of inorganic compounds and metal complexes.							
	Pail Demonstrate little or no evidence of command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of inorganic chemistry, especially those related to acid-base concept; structure and bonding of main group compounds and metal complexes; electronic absorption spectroscopy, magnetic properties as well as thermodynamic and kinetic aspects of metal complexes and their reactions; and their relevance to biological processes and materials science. Show little or no evidence of abilities to apply and integrate knowledge and theory relating to the basic 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 appropriate conclusions relating to the basic principles and knowledge of inorganic chemistry. Demonstrate minimally effective basic laboratory skills and techniques, especially in the synthesis and characterization of inorganic compounds and metal complexes.								
Course Type	Lecture wi	ith laborator	y component course						
Course Teaching	Activities	5		Details	.			No. of	Hours
& Learning Activities	Lectures								24
	Laborator	ry							24
	Tutorials	-							- 6
		/ Self study							100
Assessment Methods	Methods	•	Details		Weighting i			Assessment Methods to CLO Mapping	
- -	Assignme	ents			oourse gra	5		1,2,3,4,5	
	Examination					65	CLO	1,2,3,4,5	,
	1 -1 :					4.0	O: 0		-
	Laborator	ry reports				10 20		1,2,3,4,5 1,2,3,4,5	

Additional Course Information Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports to pass this course.

CHEM2441 Organic chemi					ademic Year	2015			
Offering Department	Chemistry			Que	ota	200			
Course Co-ordinator	Prof P Chi	u, Cher	nistry (pchiu@hku.hk)						
Teachers Involved	Prof P Chi	u, Cher	nistry						
Course Objectives	molecules This cours	, with ex	ents with the basic principle camples illustrating the role of es as the first part of the co IEM3441 Organic Chemistry II	organic chemistry in daily lit mplete program on fundan	fe and industry				
Course Contents & Topics	conformat haloalkane	ional s es, dier	onding of organic compoun- stereochemistry, chirality. Ch nes, aromatic compounds, a Principles of organic synthes	emistry of alkanes, cyccohols, thiols, and ethers	cloalkanes, a . Organometa	kenes, alkyne llic chemistry f			
Course Learning Outcomes	On succes	ssful co	mpletion of this course, studen	ts should be able to:					
	CLO 1 u	ndersta	nd basic concepts and employ	the vocabulary of organic	chemistry				
		isualize nolecule	and draw three-dimensions	al, stereochemically corre	ct representat	ions of organi			
	CLO 3 re	LO 3 recognize, discriminate and name chiral stereoisomers and diastereomers							
	CLO 4 u	LO 4 understand the reactivity of the functional groups							
	CLO 5 u	LO 5 understand reaction mechanisms and apply mechanistic knowledge to solve chemistry prob							
	CLO 6 a	CLO 6 apply reactions to the synthesis of target molecules							
	CLO 7 a	pprecia	te the relevance of organic che	emistry in biological process	ses and daily lif	е			
Pre-requisites (and Co-requisites and Impermissible combinations)	of chemist Pass in Cl in this cou	ss in CHEM1042 General chemistry I; and NOT for students who have passed in CHEM2041 Principle chemistry or already enrolled in this course (for students admitted in 2014-15 or before); ss in CHEM1042 General chemistry I; and Pass in CHEM1043 General chemistry II or already enroll this course; and NOT for students who have passed CHEM2041 Principles of chemistry or already colled in this course (for students admitted in 2015-16 or thereafter)							
Offer in 2015 - 2016	Y 1st	sem 2	nd sem	Exa	mination	Dec May			
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Course Grade Grade Descriptors	A	pertair integra Demoi chemis	nstrate a thorough mastery at an acting to the chemical properties, reacte knowledge and theory, and a sistrate highly effective organization, stry experiments.	tions and mechanisms of organi trong ability to analyze and solv understanding, and execution of	ic chemistry. Show we novel organic f lab skills and te	v a strong ability t chemistry problems chniques in organi			
	В	chemic	cal properties, reactions and mech edge and theory, and evidence of abil	nmand of knowledge and understanding of essential facts and concepts pertaining to the ons and mechanisms of organic chemistry. Show evidence of ability to integrate evidence of ability to analyze and solve novel organic chemistry problems. Demonstratistanding, and execution of lab skills and techniques in organic chemistry experiments.					
	С	C Demonstrate a general but incomplete command of knowledge and understanding of essential facts a pertaining to the chemical properties, reactions and mechanisms of organic chemistry. Show evidence of to integrate knowledge and theory, and evidence of some ability to analyze novel problems. Show a muse of knowledge to solve most familiar problems. Demonstrate adequately effective organization, unand execution of lab skills and techniques in organic chemistry experiments.							
	D	D Demonstrate a partial but limited command of knowledge and understanding of essential facts and concerning to the chemical properties, reactions and mechanisms of organic chemistry. Show evidence of ability to integrate knowledge and theory, and a limited ability to analyze novel problems. Show some correct learn one of knowledge to solve most familiar problems. Demonstrate a partially effective organ understanding and application of lab skills and techniques in organic chemistry experiments.							
	Fail								
Course Type	Lecture-ba	ased co	urse						
Course Teaching	Activities	S		Details		No. of Hour			
Learning Activities	Lectures					3			
	Tutorials					1:			
	Reading /	/ Self st	udy			10			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		sment Method o CLO Mappin			
	Assignme	ents		10					
			2 hrs written examination	75	,	CLO 1,2,3,4,5,6,7 CLO 1,2,3,4,5,6			
		Examination 2 hrs written examination Test			,2,3,4.5.0				

Required/recommended reading and online materials	Reference Book: "Organic Chemistry", by Paula Y. Bruice, 2014, 7th Edition, Pearson, with e-text and Mastering Chemistry. Chapters 3-13.	
Additional Course Information	Nil	

CHEM2442 Fundamentals	of organic	chemistr	y (6 credits)		Acade	mic Year	2015	
Offering Department	Chemistry	/			Quota		130	
Course Co-ordinator	Dr P H To	y, Chemistr	y (phtoy@hku.hk)					
Teachers Involved	Dr P H To	y, Chemistr	у					
Course Objectives	especially organic fu	in the con inctional gro	of this course is to give the text of daily life. This will laups that form the basis of our series of laboratory experir	be achie organic m	ved through the int	roduction o	f the chemistry of	
Course Contents & Topics	ketones,	carboxylic a	anic functional groups such cids and their derivatives, a conformation and stereoch	nd amin				
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1	demonstra	ate basic understanding of the	ne structi	ure of organic molec	ules		
	CLO 2	demonstra	demonstrate basic understanding of the reactivity of organic molecules					
	CLO 3	appreciate	how organic chemistry play	ys an imp	oortant role in everyo	day life		
Pre-requisites (and Co-requisites and Impermissible combinations)			Seneral chemistry I; and have passed CHEM2441 O	rganic ch	nemistry I or have all	eady enroll	ed in this course.	
Offer in 2015 - 2016	Y 1st	sem			Exam	ination	Dec	
Offer in 2016 - 2017	Y							
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive organic chemistry 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 problems.							
	B Demonstrate substantial command of organic chemistry with 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 problems.							
	С	C 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.						
	D 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 w	ith laborator	y component course					
Course Teaching	Activitie	s		Details	•		No. of Hours	
& Learning Activities	Lectures						24	
	Laborato	ory					20	
	Tutorials						5	
	Reading	/ Self study					100	
Assessment Methods and Weighting	Methods	3	Details		Weighting in fina course grade (%		ssment Methods to CLO Mapping	
	Examina	tion			6	0 0	CLO 1,2,3	
	Laborato	ry reports	Experiment & Lab report		1	5 (CLO 1,2,3	
	Test	, , , , , , , , , , , , , , , , , , , ,			2	5 (CLO 1,2,3	
Required/recommended reading and online materials	Bruice, P.	Y. Essential	Organic Chemistry (Pearso	on, 2010,	2nd edition)			
Additional Course Information		y classes a	nning to CHEM3441 should re mandatory. Students m			nts and lab	oratory reports to	

CHEM2443 Fundamentals of	f organic chemistry for pharmacy students (6 credits)	Academic Year	2015
Offering Department	Chemistry	Quota	60
Course Co-ordinator	Dr P H Toy, Chemistry (phtoy@hku.hk)		

Teachers Involved	Dr P H To	y, Chemistr	у						
Course Objectives	chemistry, chemistry	The major objective of this course is to give pharmacy students a basic understanding of organic chemistry, especially in the context of daily life. This will be achieved through the introduction of the chemistry of organic functional groups that form the basis of organic molecules. The concepts presented in the lectures will be reinforced by a series of laboratory experiments.							
Course Contents & Topics	ketones, c	arboxylic a	anic functional groups suc cids and their derivatives, onformation and stereoche	and amin					
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1	demonstra	te basic understanding of	structure	of organic molecules				
	CLO 2	CLO 2 demonstrate basic understanding of the reactivity of organic molecules							
	CLO 3	appreciate	how organic chemistry pla	ıys an im _l	portant role in everyday	life			
Pre-requisites (and Co-requisites and Impermissible combinations)	Not for stu this course	iss in CHEM1042 General chemistry I; and to for students who have passed CHEM2442 Fundamentals of organic chemistry, or already enrolled s course. his course is for BPharm students only)							
Offer in 2015 - 2016	Y 1st	sem			Examina	tion	Dec		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive organic chemistry 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 unfamilial problems.							
	В	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 problems.							
	C 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.								
	D 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 wi	th laborator	y component course						
Course Teaching	Activities	5		Details	3		No. of Hours		
& Learning Activities	Lectures						24		
	Laborator	У					20		
	Tutorials						5		
	Reading /	Self study					100		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		nent Methods CLO Mapping		
	Examinat	ion			60	CLO	O 1,2,3		
	Laboratory reports		Experiment & Lab report		15	CLO	O 1,2,3		
	Test		Test/Quiz		25	CLC	O 1,2,3		
Required/recommended reading and online materials	Bruice, P.	Y.: Essentia	l Organic Chemistry (Pears	son, 2010), 2nd edition)				
Additional Course Information	Laboratory		re mandatory. Students m	nust com	plete ALL experiments	and labora	atory reports to		

CHEM2541 Introductory ph	nysical chemistry (6 credits)	Academic Year	2015					
Offering Department	Chemistry	Quota	200					
Course Co-ordinator	Dr J Y Tang, Chemistry (jinyao@hku.hk)							
Teachers Involved	Dr J Y Tang, Chemistry							
Course Objectives	The course aims to provide a rigorous understanding of equilibrium the Students are required to apply mathematical skills (derivations and understand chemical reactions and related processes. Topics include thermodynamic properties of mixtures, solutions, chemical equilibrium reactions and reaction dynamics. Students will gain a good foundation study in Physical Chemistry.	I integrations) and be the three laws of the procedure of the contract of the contract of the procedure of the contract of the contract of the procedure of the contract of the contract of the contract of the procedure of the contract of the contract of the contract of the procedure of the contract of the contract of the contract of the procedure of the contract of the contract of the contract of the procedure of the contract of the contract of the contract of the procedure of the contract of the contra	asic physics to nermodynamics, ates of chemical					
Course Contents & Topics	Properties of Gases States of gases and the gas laws with applications.							

Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching & Learning Activities	2015-16	Demoi course abilitie Demoi course abilitie Demoi learnin critical Demoi outcon eviden apply I Demoi outcon and cri	enstrate thorough mastery at an advance learning outcomes. Show thorough gical thinking, with ability to apply knownstrate substantial command of a broat learning outcomes. Show substantials and logical thinking, and ability to appress and logical thinking, and ability to appress and logical thinking, and abilities and logical thinking and logical thinking and logical thinking are of some coherent and logical thinking and logical thinking are of some coherent and logical thinking and logical thinking are of some coherent and logical thinking and logical thinking are of some coherent and logical thinking and logical and coherent thire.	cced level of extensive knowledge and grasp of the subject. Demonstrate st wledge to a wide range of complex, far id range of knowledge and skills required al grasp of the subject. Demonstrate ply knowledge to familiar and some unand of knowledge and skills required plete grasp of the subject. Demonstrate to apply knowledge to most familiar is knowledge and skills required for attwith retention of some relevant informiting, but with limited analytical and critical and of knowledge and skills required sp of the knowledge and understandirisking. Show very little or no ability to apply the state of the knowledge and understandirisking. Show very little or no ability to apply the state of the knowledge and understandirisking.	d skills required frong analytical a miliar and unfami red for attaining a evidence of ana nfamiliar situation of the subtical abilities. Should for attaining the subtical abilities. Should for attaining the gof the subject.	Dec May for attaining all the and critical abilities liar situations. at least most of the alytical and critical ass. at least most of the course one analytical and critical and the course learning oject. Demonstrate we limited ability to the course learning Lack of analytical and Lack of analytical			
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	2015-16 c Y 1st Y A+ to F A B C D Fail	Demor course and log Demor course abilitie Demor critical Demor outcon eviden apply I Demor outcon and critical	enstrate thorough mastery at an advance learning outcomes. Show thorough gical thinking, with ability to apply knownstrate substantial command of a broat learning outcomes. Show substantials and logical thinking, and ability to appress and logical thinking, and ability to appress and logical thinking, and abilities and logical thinking and logical thinking and logical thinking are of some coherent and logical thinking and logical thinking are of some coherent and logical thinking and logical thinking are of some coherent and logical thinking and logical thinking are of some coherent and logical thinking and logical and coherent thire.	aced level of extensive knowledge and grasp of the subject. Demonstrate styledge to a wide range of complex, far ald range of knowledge and skills required a grasp of the subject. Demonstrate ply knowledge to familiar and some unand of knowledge and skills required plete grasp of the subject. Demonstrate to apply knowledge to most familiar knowledge and skills required for attwith retention of some relevant informiting, but with limited analytical and critinand of knowledge and skills required sp of the knowledge and understandiriking. Show very little or no ability to apply the subject.	d skills required frong analytical a miliar and unfami red for attaining a evidence of ana nfamiliar situation of the subtical abilities. Should for attaining the subtical abilities. Should for attaining the gof the subject.	Dec May for attaining all the and critical abilities liar situations. at least most of the alytical and critical sis. nost of the course one analytical and the course learning oper. Demonstrate ow limited ability to the course learning Lack of analytical o solve problems.			
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	2015-16 c Y 1st Y A+ to F A B C D	Demoi course abilitie Demoi course abilitie Demoi course abilitie Demoi outcon eviden apply l Demoi outcon and cri	enstrate thorough mastery at an advance learning outcomes. Show thorough gical thinking, with ability to apply knownstrate substantial command of a broat learning outcomes. Show substantials and logical thinking, and ability to appress and logical thinking, and ability to appress and logical thinking, and abilities and logical thinking and logical thinking and logical thinking are of some coherent and logical thinking and logical thinking are of some coherent and logical thinking and logical thinking are of some coherent and logical thinking and logical thinking are of some coherent and logical thinking and logical and coherent thire.	aced level of extensive knowledge and grasp of the subject. Demonstrate still will be a wide range of complex, far and range of knowledge and skills required grasp of the subject. Demonstrate ply knowledge to familiar and some urnand of knowledge and skills required plete grasp of the subject. Demonstrate to apply knowledge to most familiar knowledge and skills required for attwith retention of some relevant informing, but with limited analytical and critical and of knowledge and skills required sp of the knowledge and skills required sp of the knowledge and understandired.	d skills required frong analytical a miliar and unfami red for attaining a evidence of ana nfamiliar situation of the subtical abilities. Should for attaining the subtical abilities. Should for attaining the gof the subject.	Dec May for attaining all the and critical abilities liar situations. at least most of the alytical and critical ass. at least most of the course one analytical and critical and the course learning oject. Demonstrate we limited ability to the course learning Lack of analytical and Lack of analytical			
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Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	2015-16 c Y 1st Y A+ to F	t sem 2	2nd sem	ced level of extensive knowledge and	nation	Dec May			
Offer in 2015 - 2016 Offer in 2016 - 2017	2015-16 c Y 1st		,	Exami					
Offer in 2015 - 2016	2015-16 d Y 1st		,	Exami					
,	2015-16		,	Exami					
impermissible combinations)		or therea	ifter)		uise (ioi stude	ents admitted in			
Pre-requisites (and Co-requisites and	Pass in C chemistry Pass in C	Pass in CHEM1042 General chemistry I; and NOT for students who have passed CHEM2041 Principles of chemistry or already enrolled in this course (for students admitted in 2014-15 or before) Pass in CHEM1042 General chemistry I and CHEM1043 General chemistry II; and NOT for students who have passed CHEM2041 Principles of chemistry or already enrolled in this course (for students admitted in 2014-15).							
	CLO 5	electrochemical reactions CLO 5 demonstrate knowledge and understanding of basic reaction dynamics including reaction mechanism and how mechanism determines reaction rate law							
	CLO 4	equilibria to temperature and pressure CLO 4 understand and demonstrate knowledge of electrochemistry and its relationsh thermodynamics, can build electrochemical cell and calculate thermodynamic functions							
	CLO 3 u	understa	nd and apply the concepts	of chemical equilibrium and		e of chemical			
	-		of chemical reactions nd and demonstrate knowledge	e of the three laws of thermody	vnamics				
				nding of the properties of gase	es, molecules	in motion and			
Course Learning Outcomes		•	mpletion of this course, studen						
	Rates of 0	Chemica	l Reactions	ntal methods, rates of reaction	ns, integrated	d rate laws and			
	Molecules Molecular	s in Motion	on	model, collisions with surfac	es, the rate	of effusion and			
	Electrochemistry Electrochemical cell, relationship of electrochemical potential to thermodynamic functions. Applications of electrochemistry in energy, material science, sensing.								
	Chemical Equilibrium Spontaneous chemical reactions, the Gibbs energy minimum and equilibrium. Response of equilibria to pressure, temperature.								
	Simple Mixtures Thermodynamic description of mixtures, partial molar quantities, and chemical potentials of liquids Activities of solvent, solute, regular solutions and ions in solution.								
	The Second and Third Laws of Thermodynamics Direction of spontaneous change, entropy and the Third Law of Thermodynamics.								
		Basic concepts of work, heat, energy, expansion work, heat transactions, enthalpy and adiabatic changes and examples in relation to biochemistry and materials science.							

Required/recommended
reading
and online materials

CHEM3141 Environmental	chemistry	(6 cre	dits)		Academic	Year	2015		
Offering Department	Chemistry				Quota		100		
Course Co-ordinator	Dr W T Ch	an, Ch	emistry (wtchan@hku.hk)						
Teachers Involved	Dr W T Ch Prof A S C		emistry ng, Chemistry						
Course Objectives			duces students to Environmenta d in various environmental phen	•		underst	and the chemica		
Course Contents & Topics	tropospher Water Che chemistry, Organic po Energy: er cells)	Vaste treatment: domestic and hazardous waste treatment (landfill, incineration, air stripping, adsorptic xidation)							
Course Learning Outcomes	On succes	sful co	mpletion of this course, students	s should be able to:					
	CLO 1 demonstrate knowledge on chemical principles of the various environmental phenomena and processes								
			the practical processes of cher rgy production	mistry in atmosphere	, water purifi	ication, v	vaste treatment,		
	CLO 3 ci	itically	discuss local and global enviror	mental issues based	d on scientific	principl	es and data		
	CLO 4 a	oply kn	owledge to analyze chemical pr	ocesses involved in	various envir	onmenta	l problems		
Pre-requisites (and Co-requisites and Impermissible combinations)	chemistry	I or (041 Principles of chemistry or 0 CHEM2442 Fundamentals of al chemistry I	•	•		•		
Offer in 2015 - 2016	Y 2nd	sem			Examinati	on	May		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	В	principles, and evidence Show evidence of strong analytical abilities, logical and independent thinking, and to apply knowledge to a wide range of complex, familiar and unfamiliar situations Demonstrate highly efforganization and presentation skills.							
	presentation skills. C - 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								
	D - 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	integra	nonstrate little or no grasp of the know ation of theories, principles, and evidendent thinking, and very little or no all zation and poor presentation skills.	ence Show little or no	evidence of a	nalytical a	abilities, logical and		
Course Type	Lecture-ba	sed co	urse						
Course Teaching	Activities	•		Details			No. of Hours		
& Learning Activities	Lectures						36		
	Tutorials						12		
	Reading /	Self st	udy				100		
Assessment Methods and Weighting	Methods		Details	Weighting in course grad			sment Methods o CLO Mapping		
	Assignme	ents	(continuous assessment)	0	25		1,2,3,4		
	Examinat		,		75		1,2,3,4		
Required/recommended reading and online materials			Cann: Environmental Chemistry, nvironmental Chemistry, Lewis I						

Offering Department	Chamietry	60					
Carres Ca andinatan		2					
Course Co-ordinator		an, Chemistry (hrsccky@hku.hk)				
Teachers Involved	Prof G K Y Ch Guest lecturer	•					
Course Objectives		with typical chemical industries chemicals manufacturing and ch					
Course Contents & Topics	chemical proc	charts, units and conversions, messes to include variation in proustrial gases, beverage processes	oducts, scale, and types	of operation			
Course Learning Outcomes	On successful	completion of this course, stude	ents should be able to:				
	CLO 1 solve	basic problems of energy and n	nass balances in chemic	al and enviro	onmental processes		
	CLO 2 be fa	miliarized with a few common ch	nemical industries and ch	emical proce	esses		
	CLO 3 unde	rstand some general principles o	of industrial practice throu	ugh plant vis	its		
Pre-requisites (and Co-requisites and Impermissible combinations)		M2041 Principles of chemistry c CHEM2541 Introductory physica	9	•	or CHEM2441 Organ		
Offer in 2015 - 2016	Y 2nd sen	n		Examination	n May		
Offer in 2016 - 2017	Υ				'		
Course Grade	A+ to F						
Grade Descriptors	red thi co	Demonstrate thorough knowledge of industrial chemical processes and mastery of mass and energy balance skil required for attaining all of the course learning outcomes. Show strong analytical and critical abilities and logic thinking, with evidence of original thought, and ability to apply knowledge to solve problems in a wide range complex, familiar and unfamiliar situations. Critical use of data and sourcing of references. Apply highly effective organizational and presentational skills.					
	sk ab	B Demonstrate substantial knowledge of industrial chemical processes and command of mass and energy balance 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.					
	ba cri co	Demonstrate general but incomplete knowledge of industrial chemical processes and command of mass and energy balance 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.					
	ba	Demonstrate partial but limited knowledge of industrial chemical processes and command of mass and balance skills required for attaining some of the course learning outcomes. Show evidence of some cohe logical thinking, but with limited analytical and critical abilities. Show limited ability to apply knowledge problems. Limited ability to use data and source references. Apply limited or barely effective organization presentational skills.					
	pro	oblems. Limited ability to use data and	al and critical abilities. Show	mes. Show evice limited ability to	dence of some coherent are to apply knowledge to solve		
	Fail De ba	oblems. Limited ability to use data and	al and critical abilities. Show d source references. Apply lir ledge of industrial chemical pr urse learning outcomes. Lack polity to apply knowledge to solv	mes. Show evid limited ability to mited or barely rocesses and coof analytical and the problems. Mixed and the problems. Mixed and the problems.	dence of some coherent at to apply knowledge to sol- effective organizational at ommand of mass and ener- id critical abilities, logical at		
Course Type	Fail De ba	oblems. Limited ability to use data and esentational skills. emonstrate little or no evidence of know alance skills required for attaining the co- herent thinking. Show very little or no ab	al and critical abilities. Show d source references. Apply lir ledge of industrial chemical pr urse learning outcomes. Lack polity to apply knowledge to solv	mes. Show evid limited ability to mited or barely rocesses and coof analytical and the problems. Mixed and the problems. Mixed and the problems.	dence of some coherent at to apply knowledge to sol- effective organizational at ommand of mass and ener- id critical abilities, logical at		
Course Teaching	Fail De ba	oblems. Limited ability to use data and esentational skills. emonstrate little or no evidence of know lance skills required for attaining the co- herent thinking. Show very little or no ab ganization and presentational skills are in	al and critical abilities. Show d source references. Apply lir ledge of industrial chemical pr urse learning outcomes. Lack polity to apply knowledge to solv	mes. Show evid limited ability to mited or barely rocesses and coof analytical and the problems. Mixed the state of the problems of the state of the	dence of some coherent at to apply knowledge to sol- effective organizational at ommand of mass and ener- id critical abilities, logical at		
Course Teaching	Fail De ba co Or	oblems. Limited ability to use data and esentational skills. emonstrate little or no evidence of know lance skills required for attaining the co- herent thinking. Show very little or no ab ganization and presentational skills are in	al and critical abilities. Show d source references. Apply lir ledge of industrial chemical pr urse learning outcomes. Lack pility to apply knowledge to sol- minimally effective or ineffectiv	mes. Show evid limited ability to mited or barely rocesses and coof analytical and the problems. Mixed the state of the problems of the state of the	dence of some coherent at to apply knowledge to sol- effective organizational at ommand of mass and ener- id critical abilities, logical at isuse of data and reference		
Course Teaching	Fail De ba coo Or Lecture with la Activities Lectures	oblems. Limited ability to use data and esentational skills. emonstrate little or no evidence of know lance skills required for attaining the co- herent thinking. Show very little or no ab ganization and presentational skills are in	al and critical abilities. Show disource references. Apply lir ledge of industrial chemical prurse learning outcomes. Lack pility to apply knowledge to solminimally effective or ineffectiv	mes. Show evic limited ability t mited or barely ocesses and co of analytical an eve problems. Me.e.	dence of some coherent al to apply knowledge to sol- effective organizational an ommand of mass and ener- id critical abilities, logical ar- issuse of data and reference		
Course Type Course Teaching & Learning Activities	Fail Debacco	oblems. Limited ability to use data and esentational skills. emonstrate little or no evidence of know lance skills required for attaining the co- herent thinking. Show very little or no ab ganization and presentational skills are in	al and critical abilities. Show disource references. Apply lir ledge of industrial chemical prurse learning outcomes. Lack pility to apply knowledge to sol minimally effective or ineffective. Details computational labora	mes. Show evic limited ability t mited or barely ocesses and co of analytical an eve problems. Me.e.	dence of some coherent at to apply knowledge to solve effective organizational at mmand of mass and ener discritical abilities, logical at issue of data and reference No. of Hour 2		
Course Teaching	Fail Deba coo Or Lecture with la Activities Lectures Laboratory	oblems. Limited ability to use data and esentational skills. emonstrate little or no evidence of know alance skills required for attaining the coherent thinking. Show very little or no at aganization and presentational skills are uboratory component course	al and critical abilities. Show disource references. Apply lir ledge of industrial chemical prurse learning outcomes. Lack pility to apply knowledge to solminimally effective or ineffectiv	mes. Show evic limited ability t mited or barely ocesses and co of analytical an eve problems. Me.e.	dence of some coherent al to apply knowledge to sol- effective organizational an ommand of mass and ener- id critical abilities, logical ar- issuse of data and reference		
Course Teaching & Learning Activities	Fail Debacco Or Lecture with la Activities Lectures Laboratory Field work Reading / Sel	oblems. Limited ability to use data and esentational skills. emonstrate little or no evidence of know alance skills required for attaining the coherent thinking. Show very little or no attainination and presentational skills are uboratory component course	al and critical abilities. Show disource references. Apply lir ledge of industrial chemical prurse learning outcomes. Lack pility to apply knowledge to sol minimally effective or ineffective. Details computational labora 1 - 2 plant visits	mes. Show evic limited ability t mited or barely ocesses and co of analytical an we problems. Me.	dence of some coherent at to apply knowledge to solve effective organizational at mmand of mass and ener discritical abilities, logical at issue of data and reference No. of Hour 1 10		
Course Teaching & Learning Activities Assessment Methods	Fail Debacco Or Lecture with la Activities Lectures Laboratory Field work	oblems. Limited ability to use data and esentational skills. emonstrate little or no evidence of know alance skills required for attaining the coherent thinking. Show very little or no at aganization and presentational skills are uboratory component course	al and critical abilities. Show disource references. Apply lir ledge of industrial chemical prurse learning outcomes. Lack pility to apply knowledge to sol minimally effective or ineffective. Details computational labora	mes. Show evic limited ability t mited or barely ocesses and cc of analytical an ve problems. M e.	dence of some coherent at to apply knowledge to solve effective organizational at the solution of the solution		
Course Teaching & Learning Activities Assessment Methods	Fail Debacco Or Lecture with la Activities Lectures Laboratory Field work Reading / Sel	oblems. Limited ability to use data and esentational skills. emonstrate little or no evidence of know alance skills required for attaining the coherent thinking. Show very little or no attainination and presentational skills are uboratory component course	al and critical abilities. Show disource references. Apply lir ledge of industrial chemical prurse learning outcomes. Lack sility to apply knowledge to sol minimally effective or ineffective. Details computational laboration of the property of the prop	mes. Show evic limited ability t mited or barely ocesses and cc of analytical an ve problems. M e.	dence of some coherent at to apply knowledge to solve effective organizational at mmand of mass and ener discritical abilities, logical at issue of data and reference No. of Hour Assessment Methoc		
Course Teaching & Learning Activities Assessment Methods	Fail Deba Coo Or Coroll Lecture with la Activities Lectures Laboratory Field work Reading / Sel	oblems. Limited ability to use data and esentational skills. emonstrate little or no evidence of know ilance skills required for attaining the coherent thinking. Show very little or no at granization and presentational skills are ultoward component course. Iboratory component course f study Details	al and critical abilities. Show disource references. Apply lir ledge of industrial chemical prurse learning outcomes. Lack sility to apply knowledge to sol minimally effective or ineffective. Details computational laboration of the property of the prop	mes. Show evic limited ability t mited or barely ocesses and cc of analytical an eve problems. Me e.	dence of some coherent at to apply knowledge to solve effective organizational at the solution of the solution		
Course Teaching	Fail Debate Conference of Principles Conferenc	oblems. Limited ability to use data and esentational skills. emonstrate little or no evidence of know ilance skills required for attaining the coherent thinking. Show very little or no at granization and presentational skills are ultoward component course. Iboratory component course f study Details	al and critical abilities. Show disource references. Apply lir ledge of industrial chemical prurse learning outcomes. Lack sility to apply knowledge to sol minimally effective or ineffective. Details computational laboration of the property of the prop	mes. Show evic limited ability to mited or barely occases and co of analytical and eve problems. Me.	dence of some coherent al to apply knowledge to solveffective organizational and promated of the command of mass and energid critical abilities, logical arissuse of data and references No. of Houring Assessment Method to CLO Mappin CLO 1,2		
Course Teaching & Learning Activities Assessment Methods	Fail Department of the property of the propert	oblems. Limited ability to use data and esentational skills. esentational skills. emonstrate little or no evidence of know lance skills required for attaining the coherent thinking. Show very little or no attaining and presentational skills are unboratory component course. boratory component course f study Details continuous assessment	al and critical abilities. Show disource references. Apply lir ledge of industrial chemical prurse learning outcomes. Lack pility to apply knowledge to solminimally effective or ineffective. Details Computational labora 1 - 2 plant visits	mes. Show evic limited ability t mited or barely ocesses and cc of analytical an eve problems. Me e. attory final c (%) 5 70	cence of some coherent at to apply knowledge to solve effective organizational at the effective organization of the effective organization		

CHEM3143 Introduction to materials chemistry (6 credits)		Academic Year	2015		
Offering Department	Chemistry	Quota 100			
Course Co-ordinator	Prof W K Chan, Chemistry (waichan @hku.hk)				
Teachers Involved	Prof W K Chan, Chemistry				
Course Objectives					

	С	principles, and theories relating to the classification of materials, materials properties, synthesis and characterization of polymers, properties and applications of common polymers. Show evidence of some abilities to apply and integration theory relating to the synthesis and applications of materials. Show ability to analyze problems most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropri				
	С	properties and applications of common polymers. Show evidence to apply and integrate knowledge and theory relating to the synthesis and applications of materials. Show evidence to analyze novel problems and correct use of data and experimental results to draw appropriate conclusions relating to materials synthesis and characterization. Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts,				
	experimental results to draw appropriate and insightful conclusions relating to materials synthesis and characterization. B Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the classification of materials, materials properties, synthesis and characterization of polymers,					
Course Grade Grade Descriptors	A Demonstrate thorough knowledge and understanding of essential facts, concepts, principles, and theories relating to the classification of materials, materials properties, synthesis and characterization of polymers, properties and					
Yarraa Cuada	Y			Zamilatio	500	
Offer in 2016 - 2017		sem		Examination	n Dec	
Offer in 2016 - 2017		sem		Examination	n Dec	
Offer in 2016 - 2017		sem		Examination	n Dec	
Offer in 2016 - 2017		sem		Examination	n Dec	
Offer in 2016 - 2017		sem		Examination	n Dec	
Offer in 2016 - 2017		sem		Examination	n Dec	
mer in 2016 - 2017	V	sem		Examination	n Dec	
	Υ					
Course Grade	A+ to F					
Course Grade	A+ to F					
Course Grade	-					
	Υ					
`ourse Grade	-					
ourse Grade	A+ to F					
		Domonetrate therough knowledge and un	oretanding of occuptial facts	conconte princip	aloe, and theories relating t	
ourse Grade	-					
	Υ					
Course Grade	A+ to F					
		1				
nade bescriptors	A	the classification of materials, materials properties, synthesis and characterization of polymers, properties a applications of common polymers. Show strong ability to apply and integrate knowledge and theory relating to t synthesis and applications of materials. Show strong ability to analyze novel problems and critical use of data a				
Grade Descriptors	A	the classification of materials, materials properties, synthesis and characterization of polymers, properties applications of common polymers. Show strong ability to apply and integrate knowledge and theory relating to				
		the classification of materials, materials	properties, synthesis and ch	naracterization of	f polymers, properties an	
Course Grade	A+ to F					
	A+ to F					
Frade Descriptors	A	the classification of materials, materials properties, synthesis and characterization of polymers, properties			f polymers, properties an e and theory relating to th	
Frade Descriptors	A	the classification of materials, materials properties, synthesis and characterization of polymers, properties applications of common polymers. Show strong ability to apply and integrate knowledge and theory relating to			f polymers, properties are and theory relating to the	
		applications of common polymers. Show strong ability to apply and integrate knowledge and theory relating synthesis and applications of materials. Show strong ability to analyze novel problems and critical use of deexperimental results to draw appropriate and insightful conclusions relating to materials synthesis.				
	experimental results to draw appropriate and insightful conclusions relating to materials synthesis an					
	R		wledge and understanding o	of essential facts	concents principles an	
	theories relating to the classification of materials, materials properties, synthesis and characterization of polymers, properties and applications of common polymers. Show evidence to apply and integrate knowledge and theory					
	relating to the synthesis and applications of materials. Show evidence to analyze novel problems and correct use of					
	С	Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the classification of materials, materials properties, synthesis and characterization of polymers, properties and applications of common polymers. Show evidence of some abilities to apply and integrate				
		knowledge and theory relating to the synthesis and applications of materials. Show ability to analyze problems most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropria				
	most ramiliar situations and mostly correct out erroneous use of data and experimental results to draw appropriate conclusions relating to materials synthesis and characterization.					
	D Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the classification of materials, materials properties, synthesis and characterization of					
		polymers, properties and applications of common polymers. Show evidence of limited abilities to apply and integration knowledge and theory relating to the synthesis and applications of materials. Show limited ability to analyze proble to most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropri conclusions relating to materials synthesis and characterization.				
	Fail					
		of polymers, properties and applications integrate knowledge and theory relating tanalyze problems to most familiar situation	of common polymers. Show lift the synthesis and applications and erroneous use of data at	ttle or no eviden ons of materials.	nce of abilities to apply an Show little or no ability t	
		conclusions relating to materials synthesis	and characterization.			
Course Type	Lecture-bas	sed course				
Course Teaching			Dataila		No of House	
Course Teaching Learning Activities	Activities		Details		No. of Hour	
Learning Activities	Lectures				3	
	Lectures				3	
	Tutorials				1:	
	Reading /	Self study			10	
Assessment Methods	Methods	Details	Weighting in f		Assessment Method	
and Weighting			course grade	(%)	to CLO Mappin	
	Examination	on		70	CLO 1,2,3,4	
				-		
	Test	(continuous assessment)		30	CLO 1,2,3,4	

CHEM3146 Principles a (6 credits)	and applications of spectroscopic and analytical techniques	Academic Year	2015		
Offering Department	Chemistry	Quota	200		
Course Co-ordinator	Dr X Li, Chemistry (xiangli @hku.hk)				
Teachers Involved	Dr X Li, Chemistry				
Course Objectives	To cover the principles and applications of modern practical spectro course is a pre-requisite for the advanced chemistry courses.	To cover the principles and applications of modern practical spectroscopic and analytical techniques.			

Course Contents & Topics		UV-Visible Absorption Spectroscopy, Nuclear Magnetic Resonance Spectroscopy, Mass Spectrometry, Infra-red Spectroscopy, Elemental Analysis, Molecular Formulas and analysis of data.					
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1	understa techniqu	derstand the basic principles and applications of IR, UV/Vis, MS and NMR spectroscop chniques				
	CLO 2	CLO 2 describe and explain the terminology of IR, UV/Vis, MS and NMR spectroscopies					
	CLO 3		chemical structure elucidatio copic data	on and analysis based o	on UV/Vis, MS and NMR		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	any CHE	M2XXX level course				
Offer in 2015 - 2016	Y 2	nd sem		Exami	nation May		
Offer in 2016 - 2017	N			·	·		
Course Grade	A+ to F						
Grade Descriptors	A	course	onstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the le learning outcomes. Show strong analytical and critical abilities and logical thinking, and ability to appleedge to a wide range of complex, familiar and unfamiliar situations.				
	В	course	nstrate substantial command of a broad e learning outcomes. Show evidence of edge to familiar and some unfamiliar situ	analytical and critical abilities and	uired for attaining at least most of the logical thinking, and 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 familiar situations.					
	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.					
	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.					
Course Type	Lecture-	based co	urse				
Course Teaching	Activit	ies		Details	No. of Hours		
& Learning Activities	Lecture				36		
	Tutoria	-			12		
		g / Self st	udv		100		
Assessment Methods							
and Weighting	Method	ds	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assigni	ments		15	CLO 1,2,3		
	Examination			70	CLO 1,2,3		
	Test		(2 quizzes)	15	CLO 1,2,3		
Required/recommended reading and online materials	2001, 3	d & 4th e	Gary M. Lampman, George S dition) c Spectroscopy (Macmillan, 199	·	troscopy (Thomson Learning		
Additional Course Information	Sugges	ted follow-	-up course: CHEM3241				

CHEM3241 Analytical cher	mistry II:	chemical instrumentation (6 credits)	Academic Year	2015		
Offering Department	Chemis	nistry Quota 80				
Course Co-ordinator	Dr W T	Chan, Chemistry (wtchan@hku.hk)				
Teachers Involved		Chan, Chemistry hu, Chemistry				
Course Objectives		er the basic principles and applications of chemical instr knowledge, in addition to the principles, of instrumen ries.				
Course Contents & Topics	spectron Separat and gas Mass sp	Optical methods: Beer's Law; UV-visible, infrared, and atomic spectrometry; fluorescence; atomic massipectrometry; grating spectrometer; photon detectors and thermal detectors. Separation methods: partition; chromatography theories; high performance liquid chromatography (HPLC) and gc. Mass spectrometry: fundamental concept of mass spectrometry; electrospray ionization (ESI) and matril issisted laser desorption ionization (MALDI); time-of-flight (TOF) and quadrupole (Q) mass analyzers.				
Course Learning Outcomes	On succ	essful completion of this course, students should be able	to:			
	CLO 1	explain the principles of the optical methods, separation	methods, and mass spec	trometry		
	CLO 2 describe the basic experimental set up and the properties of the basic components of instruments used in the laboratory classes					
	CLO 3 apply experimental skills in chemical analysis including sample preparation, standard solution preparation, instrument calibration, and matrix effects correction (standard additions)					

Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in CHEM224	1 Anlytical chemistry I					
Offer in 2015 - 2016	Y 1st sem			Examina	tion	Dec	
Offer in 2016 - 2017	Υ			'		'	
Course Grade	A+ to F						
Grade Descriptors	thinking highly	onstrate thorough grasp of the subject g, and ablility to apply knowledge to a proficient lab skills and techniques sions Demonstrate highly effective	a wide range and critical	of complex, familiar and unfa	amiliar situat	tions Demonstrate	
	evidend Demon	onstrate substantial grasp of the sul ce of independent thinking, and ab strate proficient lab skills and technic enstrate effective organization and pre	oility to appl ques and co	ly knowledge to familiar and rrect use of data and results to	d some unf	amiliar situations	
	thinking Demon	onstrate general but incomplete gras g, little evidence of independent the strate adequate lab skills and techni propriate conclusions Demonstrate	ninking, and iques and m	ability to apply knowledge nostly correct but some errone	to most faceous use of	amiliar situations data and results to	
	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 with labora	atory component course					
Course Teaching	Activities		Details	<u> </u>		No. of Hours	
& Learning Activities	Lectures					24	
	Laboratory					28	
	Tutorials					12	
	Reading / Self study					100	
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	Assessment Metho		
	Examination			70	CI	_O 1,2,3	
	Laboratory report	s including an oral present	ation	20	CI	_O 1,2,3	
	Test	-		10	CI	_O 1,2,3	
Required/recommended reading and online materials		Holler, S.R. Crouch: Principles West, F.J. Holler, and S.R.					
Additional Course Information	Laboratory classe pass this course.	s are mandatory. Students r	must com	plete ALL experiments	and labo	ratory reports to	

CHEM3242 Food and water	analysis	(6 credits)	Academic Year	2015		
Offering Department	Chemistry Quota 50					
Course Co-ordinator	Dr K M N	lg, Chemistry (kwanmng@hku.hk)	'			
Teachers Involved		u, Chemistry lg, Chemistry				
Course Objectives		areas in the application and new methodology developm water analysis.	nent in analytical chemis	try with focus or		
Course Contents & Topics	and water Food Anacontent, additives Water An technology recreation Analytica digestion	I Analysis in Practicing Laboratories: Use of standard mean analysis; good laboratory practice; reliability and quality alysis: Requirement of nutritional labeling; determination as sodium content); detection of food adulteration and of toxins, undeclared components); recent issues and case analysis: Water quality standards; sampling, pretreatment gies for field, laboratory and automated analysis of selection and water, waste water). Il Method Development: Selection, application and of the solid phase extraction and instrumental (e.g. GC, Limethod validation (e.g. recovery analysis, analysis of certifications).	of food nutritional value (contamination (e.g. preses studies in food analysis), strange of water same ceed types of water (e.g. combination of analytic LC, MS) techniques for	e.g. total proteinence of banner ples; theory and drinking water al (e.g. sample food and wate		
Course Learning Outcomes	On succe	essful completion of this course, students should be able t	iO:			
	CLO 1	identify and determine errors and uncertainty of analytic	al results			
	CLO 2 apply measures taken to control quality and ensure reliability of analytical results					

	CLO 3	demonstrat	te a general knowledge in fo	ood and w	ater analysis			
	CLO 4	understand	l issues in public health prot	ection rel	ated to chemical analy	rsis		
	CLO 5 carry out analytical techniques used in practicing food and water laboratories							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in CHEM2041 Principles of chemistry or CHEM2241 Analytical chemistry I or CHEM2341 Inorg chemistry I or CHEM2441 Organic chemistry I or CHEM2541 Introductory physical chemistry/Physichemistry I; and Pass in CHEM3241 Analytical chemistry II: chemical instrumentation, or already enrolled in this course.						emistry/Physical	
Offer in 2015 - 2016	Y 2nd	Y 2nd sem Examination May						
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	water analy course lea knowledge	te through a thorough grasp of the ysis to acquire accurate results warning outcomes. Show strong an learnt to solve a wide range of control of the solve and present the solve and present the solve and present the solve and present the solve are solved to the solve and present the solve are solved as the solved are so	vith full inte nalytical and omplex issu	rpretation for analytical ap d critical abilities, logical t es and problems related to	plication as c hinking and	lescribed in all the capability to apply	
	В	the course apply know	te a substantial command of a bro learning outcomes. Show evider rledge learnt to solve a wide rang by effective organization and prese	ice of analy ie of comple	rtical and critical abilities, le ex issues and problems rel	ogical thinking	g, and capability to	
	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 the analysis of food and water. Apply effective organization and presentation skills as shown in class work.							
	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 the analysis of food and water. 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 outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to apply knowledge to solve problems related to the analysis of food and water. Organization and presentation skills are minimally effective or ineffective as shown in class work.							
Course Type	Lecture w	vith laborator	y component course					
Course Teaching	Activities Details					No. of Hours		
& Learning Activities	Lectures						24	
	Laborato	ory					24	
	Tutorials	·					8	
	Reading / Self study						100	
Assessment Methods and Weighting	Methods	3	Details		Weighting in final course grade (%)		ment Methods CLO Mapping	
	Assignm	ents			5	CLC	0 1,2,3,4	
	Examina	tion			70	CLC	0 1,2,3,4	
	Laborato	ory reports	coursework assessment i laboratory work	ncluding	15	С	LO 2,5	
	Test				10	CLC	1,2,3,4	
Required/recommended reading and online materials		oog, D. M. latest editio	West, F. J. Holler, S.R. (n)	Crouch: F	undamentals of Anal	tical Cher	nistry (Cengage	
Additional Course Information		y classes a	list texts and other publishere mandatory. Students m					

CHEM3243 Introductory in	Academic Year	2015				
Offering Department	Chemistry Quota 65					
Course Co-ordinator	Dr X Li, Chemistry (xiangli@hku.hk)					
Teachers Involved	Dr X Li, Chemistry Dr K C J Wong, Pharmacology and Pharmacy					
Course Objectives	This course is designed for non-chemistry major students covering basic principles of separation an spectroscopy for chemical analysis. This course provides a general foundation for further studies pharmacology, life and environmental sciences.					
Course Contents & Topics	Optical methods: Beer's Law; UV-visible, infrared, and atomic spec spectrometry; grating spectrometer; photon detectors and thermal det Separation methods: partition; chromatography theories; high performand gas chromatography (GC); instrumental set up of HPLC and GC. Mass spectrometry: fundamental concept of mass spectrometry; ele assisted laser desorption ionization (MALDI); time-of-flight (TOF) and NMR: basic principle of nuclear magnetic resonance. Analysis and quality assurance: statistical analysis of small sets of da	ectors. The start of the start	ography (HPLC)			
Course Learning Outcomes						

	On succe	essful comple	etion of this course,	students sho	uld be able to:			
	CLO 1	explain the p	rinciples of the option	cal methods,	separation metho	ds, mass	spectrome	etry, and NMR
		CLO 2 describe the basic experimental set up and the properties of the basic composinstruments used in the laboratory classes					ponents of the	
Pre-requisites (and Co-requisites and Impermissible combinations)	Not for s	Pass in CHEM2041 Principles of chemistry or CHEM2241 Analytical chemistry I; and Not for students who have passed CHEM3241 Analytical chemistry II: chemical instrumentation or largedy enrolled in this course.					entation or have	
Offer in 2015 - 2016	Y 2n	nd sem				Examina	tion	May
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	thinking, an highly profi	ate thorough grasp of the dablility to apply knowled cient lab skills and tects Demonstrate highly e	edge to a wide ra nniques and criti	ange of complex, fami ical use of data and	liar and unfa results to	amiliar situati	ions Demonstrate
	В	evidence of Demonstrati	rate substantial grasp of independent thinking, te proficient lab skills anate effective organization	and ability to a d techniques and	apply knowledge to d correct use of data a	familiar and	d some unfa	amiliar situations
	С	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	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	analytical a - Demonstr	rate little or no grasp of bilities, logical and indep rate minimally effective raw appropriate conclusi	endent thinking, or ineffective lat	and very little or no a b skills and techniqu	bility to app es and mis	ly knowledge use of data	to solve problems. and results and/or
Course Type	Lecture v	with laborator	y component cours	e				
Course Teaching	Activitie	es		Det	ails			No. of Hours
& Learning Activities	Lectures	S						24
	Laborat	ory						28
	Reading	Reading / Self study						100
Assessment Methods and Weighting	Method	ls	Details	'	Weighting course gra			sment Methods CLO Mapping
	Examina	ation				70	С	LO 1,2
	Laborat	ory reports				15	С	LO 1,2
	Test					15	С	LO 1,2
Required/recommended reading and online materials	D.A. Sk	oog, D.M. \	er, S.R. Crouch: Pri West, F.J. Holler, lytical Chemistry (Tl	and S.R. C	http://webapp.sci			
Additional Course Information		Fundamentals of Analytical Chemistry (Thomson, latest edition) Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports pass this course.						

CHEM3244 Analytical tech	nniques for pharmacy students (6 credits)	Academic Year	2015			
Offering Department	Chemistry	Quota 35				
Course Co-ordinator	Dr X Li, Chemistry (xiangli@hku.hk)					
Teachers Involved	Dr X Li, Chemistry Dr K C J Wong, Pharmacology and Pharmacy					
Course Objectives	This course is designed for Bachelor of Pharmacy students to p and measurement techniques that are important to pharmacology					
Course Contents & Topics	Principles and Applications of different analytical and measureme such as drug analysis and pharmacokinetics studies Analysis and quality assurance: statistical analysis of data, control Analysis by Optical methods: Beer's Law; instrumentation, gra spectrometry: UV-visible, infrared, and atomic; emission spectrom Sample Separation and Purification: partition; chromatograp chromatography (HPLC) and gas chromatography (GC); instrumed Molecular Mass Measurements: mass spectrometry-fundamental including electrospray ionization (ESI) and matrix-assisted laser flight (TOF) and quadrupole (Q) mass analyzers; use of mass spectrometry-fundamental including electrospray ionization (ESI) and matrix-assisted laser flight (TOF) and quadrupole (Q) mass analyzers; use of mass spectrometry-fundamental including electrospray ionization (ESI) and matrix-assisted laser flight (TOF) and quadrupole (Q) mass analyzers; use of mass spectrometry-fundamental including electrospray ionization (ESI) and matrix-assisted laser flight (TOF) and quadrupole (Q) mass analyzers; use of mass spectrometry-fundamental including electrospray ionization (ESI) and matrix-assisted laser flight (TOF) and quadrupole (Q) mass analyzers; use of mass spectrometry-fundamental including electrospray ionization (ESI) and matrix-assisted laser flight (TOF) and quadrupole (Q) mass analyzers; use of mass spectrometry-fundamental including electrospray ionization (ESI) and matrix-assisted laser flight (TOF) and quadrupole (Q) mass analyzers; use of mass spectrometry-fundamental including electrospray ionization (ESI) and matrix-assisted laser flight (TOF) and quadrupole (Q) mass analyzers; use of mass spectrometry-fundamental including electrospray ionization (ESI) and matrix-assisted laser flight (TOF) and quadrupole (Q) mass analyzers; use of mass spectrometry-fundamental including electrospray ionization (ESI) and matrix-assisted electrospray ionization (ESI) and matrix-assisted electrospray ionization (ESI) and matrix-assisted electrospray ionization (ESI) a	chart. ting spectrometer, deteretry; only theories; high perentation of HPLC and GC concepts; various ionizer desorption ionization	ectors; absorption rformance liquide. cation technique (MALDI); time-o			

			sonance: basic principles; i al and pharmaceutical impo		tations; applications in	structure	determination o	
Course Learning Outcomes	On succ	cessful comple	etion of this course, student	s should	be able to:			
	CLO 1	CLO 1 demonstrate knowledge and understanding of the principles of different optical methods, separation methods, mass spectrometry, NMR spectroscopy and their applications in pharmaceutical sciences						
	CLO 2		basic experimental set used in the laboratory class		he properties of the b	asic com	ponents of the	
	CLO 3		mental skills in chemical a instrument calibration, mat				andard solution	
Pre-requisites (and Co-requisites and Impermissible combinations)		narm students BPHM2136 P	only; and hysical chemistry: principle	s and ap	plications in pharmaceu	tical scien	nce	
Offer in 2015 - 2016	Y 2	nd sem			Examina	tion	May	
Offer in 2016 - 2017	Υ				·			
Course Grade	A+ to F							
Grade Descriptors	A	thinking, ar highly prof	rate thorough grasp of the subject and ablility to apply knowledge to a cient lab skills and techniques a s Demonstrate highly effective o	wide range and critical	of complex, familiar and unfa- use of data and results to	miliar situat	ions Demonstrate	
	В	evidence of Demonstra	 Demonstrate substantial grasp of the subject Show evidence of analytical abilities and logical thinking, som 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 e limited analytical abilities, little or no evidence of independent thinking, and limited ability to apply knowledge problems Demonstrate partially effective lab skills and techniques and limited ability to use data and resu appropriate conclusions Demonstrate limited or barely effective organization and presentation skills.						
	Fail	analytical a	rate little or no grasp of the know bilities, logical and independent the rate minimally effective or ineffec- raw appropriate conclusions De	ninking, and ctive lab sk	I very little or no ability to applicitles and techniques and mis	y knowledge use of data	e to solve problems. and results and/or	
Course Type	Lecture	with laborator	y component course					
Course Teaching	Activit	ies		Details	S		No. of Hours	
& Learning Activities	Lecture	es					24	
	Labora	tory					28	
	Readir	g / Self study					100	
Assessment Methods and Weighting	Metho	ds	Details		Weighting in final course grade (%)		sment Methods CLO Mapping	
	Examination				70	CL	O 1,2,3	
	Laboratory reports				15	CL	O 1,2,3	
	Test				15	CL	O 1,2,3	
Required/recommended reading and online materials		oog, D.M. W	er, S.R. Crouch: Principles est, F.J. Holler, and S.R. (
Additional Course Information	Laborat		rmacy students ONLY. re mandatory. Students m	nust com	plete ALL experiments	and labo	ratory reports to	

CHEM3341 Inorganic cher	nistry II (6 credits)	Academic Year	2015		
Offering Department	Chemistry	Quota 90			
Course Co-ordinator	Prof V W W Yam, Chemistry (wwyam@hku.hk)				
Teachers Involved	Prof V W W Yam, Chemistry Dr A M Y Yuen, Chemistry				
Course Objectives	This course is a continuation from CHEM2341 Inorganic Cher general inorganic chemistry, with examples relevance to biologi to the needs of those intending to extend their studies in chemis	ical processes and materia			
Course Contents & Topics	Chemistry of selected classes of inorganic, coordination a mechanisms of their reaction where appropriate. Structure, bonding, magnetism and spectral properties of i bioinorganic systems.		·		
Course Learning Outcomes					

	On succe	essful co	mpletion of this course, students	s should be able to:		
			trate knowledge of chemistry netallic compounds	of selected classes	of inorganic	c, coordination and
	CLO 2	understa	and structure, bonding, magnetis	m and spectral properti	es of inorgani	c systems
	CLO 3	to coordination and				
	CLO 4	gain app	ropriate knowledge of coordinat	ion compounds in biolog	gical systems	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in C	HEM23	41 Inorganic chemistry I			
Offer in 2015 - 2016	Y 1s	t sem		E	Examination	Dec
Offer in 2016 - 2017	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	the minorga prope integri strong insigh chemi	nstrate thorough knowledge and undersore advanced foundation knowledge of inic, coordination and organometallic tries of inorganic systems including eate knowledge and theory relating to the ability to analyze novel problems and tful conclusions relating to the essentia stry. Demonstrate highly effective labor of inorganic compounds and metal com	inorganic chemistry, especially compounds; mechanisms o oxamples in bioinorganic systemore advanced foundation critical use of data and expuland and advanced foundation critical use of data and expulsion advanced foundation skills and techniques,	those related to f reactions; and tems. Show stro knowledge of in erimental results ion principles and especially in the	structure and bonding of I magnetic and spectral ong ability to apply and organic chemistry. Show to draw appropriate and d knowledge of inorganic synthesis and reactivity
	В	theoric structor magni apply chemi appro inorga	nstrate substantial command of know es relating to the more advanced four ure and bonding of inorganic, coordin etic and spectral properties of inorganic and integrate knowledge and theory stry. Show evidence to analyze novel priate conclusions relating to the es- nic chemistry. Demonstrate effective la of inorganic compounds and metal com	ndation knowledge of inorgar ation and organometallic oxystems including examples i relating to the more advar problems and correct use c sential and more advanced boratory skills and techniques	nic chemistry, es inpounds; mechan in bioinorganic sy inced foundation of data and expe foundation prince, especially in the	pecially those related to anisms of reactions; and stems. Show evidence to knowledge of inorganic erimental results to draw iples and knowledge of e synthesis and reactivity
	С	princip relate and r evider knowl errone advan skills	nstrate general but incomplete commoles, and theories relating to the more a d to structure and bonding of inorganic, nagnetic and spectral properties of in nice of some abilities to apply and interedge of inorganic chemistry. Show abilitieous use of data and experimental resultant properties of undation principles and knowled and techniques, especially in the syntheter characterization by various spectros	dvanced foundation knowledge coordination and organomes to organic systems including e grate knowledge and theory it to analyze problems to mosults to draw appropriate concludes of inorganic chemistry. De seis and reactivity study of inc	ge of inorganic ch llic compounds; r xamples in bioir relating to the mo t familiar situation usions relating to monstrate moder	nemistry, especially those mechanisms of reactions; norganic systems. Show ore advanced foundation ns and mostly correct but to the essential and more rately effective laboratory
	D	and the struction magnification in the control of t	nstrate partial but limited command of teories relating to the more advanced foure and bonding of inorganic, coordinatic and spectral properties of inorganic dabilities to apply and integrate knowle inic chemistry. Show limited ability to eous use of data and experimental resided foundation principles and knowle and techniques, especially in the synthetic characterization by various spectros	oundation knowledge of inorgi- ation and organometallic or- systems including examples or doge and theory relating to the analyze problems to most if utalyze problems to most if utalyze problems to most of doge of inorganic chemistry. I seis and reactivity study of inc	anic chemistry, e npounds; mecha n bioinorganic sy more advanced amiliar situations usions relating to Demonstrate par	specially those related to anisms of reactions; and stems. Show evidence of foundation knowledge of s and mostly correct but to the essential and more tially effective laboratory
	Fail	Demo princip relate and m no ev knowl errone advan skills	nstrate little or no evidence of commoles, and theories relating to the more and to structure and bonding of inorganic, hagnetic and spectral properties of inorgidence of abilities to apply and integredge of inorganic chemistry. Show lite edge of inorganic principles and knowled could be a conditionally in the synthesis of the could be a conditionally in the synthesis characterization by various spectros	nand of knowledge and unc dvanced foundation knowledge coordination and organometa anic systems including examp ate knowledge and theory re title or no ability to analyze p ults to draw appropriate concil (ge of inorganic chemistry. D sais and reactivity study of inc	ge of inorganic ch llic compounds; rolles in bioinorgan elating to the mo problems to mos usions relating to emonstrate minir	nemistry, especially those mechanisms of reactions; aic systems. Show little or advanced foundation of familiar situations and to the essential and more mally effective laboratory
Course Type	Lecture v	vith labo	ratory component course			
Course Teaching	Activitie		, ,	Details		No. of Hours
& Learning Activities	Lectures			Details		No. or Hours
	Laborate					24
	Tutorials	•				6
	Reading		udy			100
Assessment Methods and Weighting	Method		Details	Weighting in fin		sessment Methods to CLO Mapping
	Assignm	ents	including lab report & test			CLO 1,2,3,4
	Examina		<u> </u>			CLO 1,2,3,4
Required/recommended reading and online materials	Shriver &	Atkins,	Inorganic Chemistry (4th Ed.), Cecroft & Sharpe, Inorganic Chem	Oxford University Press,	2005	,
Additional Course Information	Laborato		es are mandatory. Students m	ust complete ALL expe	eriments and	laboratory reports to

Offering Department	Chemistry				Quota		50		
Course Co-ordinator	Prof H Z S	un, Che	emistry (hsun@hku.hk)		I				
Teachers Involved		•	Chemistry						
	Prof H Z S		•						
Course Objectives	and more processes	details and m	continuation from Basic Inorgan of inorganic chemistry in bio edical science, suited to the r medical science.	ologica	al system, with examples	relevand	ce to biologic		
Course Contents & Topics	biochemist metals in	panic Chemistry of selected topics of interest. Examples include the inorganic chemistry (a nistry) behind the requirement of biological cells for metals such as zinc, iron and copper; a in medicine such as mechanisms by which organisms obtain required metal ions from the ment, and use of metal-containing compounds in treating diseases such as cancer.							
Course Learning Outcomes	On succes	On successful completion of this course, students should be able to:							
	CLO 1 ui	ndersta	nd the principles and concepts of	of inor	ganic/organic chemistry in bi	ological	system		
		ndersta	nd structure, bonding, and spec	ctral p	roperties of selected metals	in protei	ins and nuclei		
		ndersta	nd chemical mechanisms of s	electe	ed metal homeostasis (i.e.	uptake,	transport an		
			nd the role of metal complexes	medic	ine				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Ch	HEM234	11 Inorganic chemistry I						
Offer in 2015 - 2016	Y 2nd	sem			Examination	n	May		
Offer in 2016 - 2017	Υ				'				
Course Grade	A+ to F								
		chelation biologic integral ability to conclust basic to	sic foundation knowledge of bioinorga on; structure and bonding of metals in I cal processes and their relevance to m te knowledge and theory relating to th to analyze novel problems and critical i sions relating to the basic principles a echniques, especially in the characteriz- instrate substantial command of knowle	biologic etal hor e basic use of c nd know ation of	al systems; thermodynamic and kin mesostasis; metal-based drugs. Sho foundation knowledge of bioinorga data and experimental results to dra wledge of bioinorganic chemistry. I inorganic active site and overall me	etic aspectory strong a strong	cts of metal ions in ability to apply an istry. Show stron riate and insightful ate highly effectivelecules.		
	В	theories relating to the basic foundation knowledge of bioinorganic chemistry, especially those related to hard-acid-base theory; chelation; structure and bonding of metals in biological systems; thermodynamic and kir aspects of metal ions in biological processes and their relevance to metal homeostasis; metal-based drugs. Si evidence to apply and integrate knowledge and theory relating to the basic foundation knowledge of bioinorg chemistry. Show evidence to analyze novel problems and correct use of data and experimental results to appropriate conclusions relating to the basic principles and knowledge of bioinorganic chemistry. Demonst effective basic techniques, especially in the characterization of inorganic active site and overall metallo-biomolecu					elated to hard-so namic and kinet ased drugs. Sho ge of bioinorgan tal results to dra istry. Demonstrat		
	С	princip to hard kinetic Show knowle but err and kr	astrate general but incomplete comm les, and theories relating to the basic for I-soft acid-base theory; chelation; structure aspects of metal ions in biological pro evidence of some abilities to apply a doge of bioinorganic chemistry. Show all oneous use of data and experimental in nowledge of bioinorganic chemistry. Le terization of inorganic active site and over the structure of the structure of the terization of inorganic active site and over the structure of the structure of the terization of inorganic active site and over the structure of the structure of the the structure of the structure of the the structure of the structure of the structure of the structure of the structure of the the structure of the structure of the the structure of the structure of the structure of the struc	oundation cture and cesses and interpolation bility to results demons	on knowledge of bioinorganic chemi d bonding of metals in biological s and their relevance to metal home egrate knowledge and theory relat analyze problems to most familiar is to draw appropriate conclusions re trate moderately effective basic te	stry, especystems; the costasis; ming to the situations a	cially those relate nermodynamic an netal-based drug basic foundatio and mostly corre ne basic principle		
	D	Demor and the soft ac aspect eviden- bioinor errone- knowle	nstrate partial but limited command of secries relating to the basic foundation in id-base theory; chelation; structure and so of metal ions in biological processes of limited abilities to apply and integranic chemistry. Show limited ability to ous use of data and experimental resurge of bioinorganic chemistry. Deterization of inorganic active site and over	knowled knowled d bondi and the ate kno o analy lts to di monstra	dge and understanding of essential dge of bioinorganic chemistry, espeng of metals in biological systems; eir relevance to metal homeostasis wledge and theory relating to the base problems to most familiar situar raw appropriate conclusions relating te partially effective basic tech	ecially thos thermody s; metal-basic foundations and g to the base	se related to hard ynamic and kineti ased drugs. Show ation knowledge of mostly correct but asic principles an		
	Fail	princip to hard kinetic Show I knowle errone knowle	astrate little or no evidence of commes, and theories relating to the basic for l-soft acid-base theory; chelation; structure aspects of metal ions in biological pro little or no evidence of abilities to apply dge of bioinorganic chemistry. Show lous use of data and experimental resudge of bioinorganic chemistry. Der terization of inorganic active site and over	oundation cture and cesses y and in little or lts to di nonstra	on knowledge of bioinorganic chemi d bonding of metals in biological s and their relevance to metal home ntegrate knowledge and theory rela no ability to analyze problems to raw appropriate conclusions relating te minimally effective basic tec	stry, especystems; the costasis; mating to the most family to the bases.	cially those relate nermodynamic an netal-based drugs e basic foundatio iliar situations an asic principles an		
Course Type	Lecture-ba	sed cou	ırse						
Course Teaching	Activities			Deta	ils		No. of Hour		
& Learning Activities	Lectures						3		
	Tutorials			inclu pres	ding literature survey a entation	<u> </u>	1.		
	Reading /	Self stu	udy				10		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		ment Method CLO Mappin		

	Assignments	(continuous assessment of assignments and presentation)	25	CLO 1,2,3,4
	Examination		75	CLO 1,2,3,4
Required/recommended reading and online materials	CA, 1994 Bertini, I.; Gray, I	d Berg, J. M. Principles of Bioinorga H. B.; Stiefel, E. I.; Valentine, J. S., ε rsity Science Books, 2007	, ,	
Additional Course Information		Moore C., RSC Publishing, 2010. emistry: Inorganic Elements in the C 113.	Chemistry of Life, Kai	m W. & Schwederski B., John

CHEM3441 Organic chemi	stry II (6 c	redits)			Ac	ademic Year	2015		
Offering Department	Chemistr	у			Qu	ıota	80		
Course Co-ordinator	Prof D Ya	Prof D Yang, Chemistry (yangdan@hku.hk)							
Teachers Involved	Prof D Ya	ang, Che	mistry						
Course Objectives	organic c	hemistry and read	from CHEM2441 Organic C together with CHEM2441. tivity of organic molecules, v	It focuse	s primarily on the b	oasic principles	to understand th		
Course Contents & Topics	derivative reaction	Chemistry of common organic functional groups: ketones and aldehydes; carboxylic acids and erivatives; amines; aromatic compounds. Principles of organic synthesis. Detailed consideration eaction mechanisms. Spectroscopic tools (UV-Vis, IR, NMR, and MS) for characterization dentification of organic compounds.							
Course Learning Outcomes	On succe	essful cor	npletion of this course, stude	ents shou	ld be able to:				
	CLO 1	1 draw correct structural representations of organic molecules							
	CLO 2	understa	nd the basic principles of str	ucture an	d reactivity of orga	nic molecules			
			e structures of organic comp		, ,				
	CLO 4	write reas	sonable mechanisms for tran compounds, aldehydes, ke nitriles, and amines)	nsformati	ons of common fur	· nctional groups (
	CLO 5	CLO 5 appreciate the importance of organic chemistry in daily life							
	CLO 6	devise sy	nthetic pathways to organic	compour	nds using functiona	using functional group chemistry			
Pre-requisites and Co-requisites and mpermissible combinations)	[Remarks 2015-16.	Pass in CHEM2441 Organic chemistry I [Remarks: CHEM3441 Organic chemistry II will be changed to lecture-based course from seme 2015-16. For Chemistry students who admitted in 2014-15 or before, they must enroll also CHEM3 enrolling CHEM3441 (new version without lab component) to meet the Chemistry Major requirements							
Offer in 2015 - 2016	Y 1s	t sem 2	nd sem		Ex	amination	Dec May		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attain course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations.				evidence of origin			
	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.								
	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 knowledge to most familiar situations.							
	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.							
	Fail	outcom	strate little or no evidence of con les. Lack of analytical and critical a dge to solve problems.						
Course Type	Lecture-b	pased cou	ırse						
Course Teaching	Activitie	es		Deta	ails		No. of Hour		
Learning Activities	Lectures	S					3		
	Tutorials						1		
	Reading	/ Self stu	ıdy				10		
Assessment Methods and Weighting	Method	s	Details		Weighting in fina		sment Method o CLO Mappin		
		Evamination 1 x 2 hr written evamination			3 (/*	•	- 1- 1		
	Examina	ation	1 x 3 hr written examination		70	CLO 1	,2,3,4,5,6		

Required/recommended reading and online materials

"Organic Chemistry", by Paula Y. Bruice, 2014, 7th Edition, Pearson, with e-text and Mastering Chemistry. Chapters 14-20.

CHEM3442 Organic chemis	try of bio	molec	ules (6 credits)		Academic Yea	r 2015		
Offering Department	Chemistry	y			Quota	50		
Course Co-ordinator	Dr P H To	or P H Toy, Chemistry (phtoy@hku.hk)						
Teachers Involved	Dr P H To	r P H Toy, Chemistry						
Course Objectives			ive of this course is to give the in biology and biochemistry.	students an understa	anding and appro	eciation of the role of		
Course Contents & Topics		•	f organic molecule groups suc pids will discussed. Enzyme ca	•				
Course Learning Outcomes	On succe	ssful co	mpletion of this course, students	s should be able to:				
	CLO 1	have a	basic understanding of biologica	ally important organic	molecules			
	CLO 2	have a	basic understanding of enzyme	catalysis				
	CLO 3	appreci	ate how organic chemistry plays	an important role in	biology and biod	hemistry		
Pre-requisites (and Co-requisites and Impermissible combinations)			42 Fundamentals of organic ch dents or CHEM3441 Organic ch	•	3 Fundamentals	of organic chemist		
Offer in 2015 - 2016	Y 1st	sem			Examination	Dec		
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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 of original thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar problems. Apply highly effective organizational and presentational skills.							
	В	Demonstrate substantial command of biomolecule organic chemistry with 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 problems. Apply effective organizational and presentational skills.						
	С	attaini thinkir	Demonstrate general but incomplete command of biomolecule organic chemistry knowledge, and skills required tattaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logic thinking, and ability to apply knowledge to most familiar problems. Apply moderately effective organizational arpresentational skills.					
	Demonstrate partial but limited command of biomolecule 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. Apply limited or barely effective organizational and presentational skills.							
	Fail	attaini very li	nstrate little or no evidence of commar ng the course learning outcomes. Lack ittle or no ability to apply knowledge to ve or ineffective.	of analytical and critical	abilities, logical and	coherent thinking. Show		
Course Type	Lecture-b	ased co	urse					
Course Teaching	Activitie	s		Details		No. of Hours		
& Learning Activities	Lectures					36		
	Tutorials					12		
	Reading		udv			100		
Accessment Matheda	rtodding	7 0011 01				100		
Assessment Methods and Weighting	Methods	8	Details	Weighting in course grad		sessment Methods to CLO Mapping		
	Examina	tion			60	CLO 1,2,3		
	Presenta	ation			10	CLO 1,2,3		
	Test		2-mid term tests		30	CLO 1,2,3		
Required/recommended reading and online materials	Paula Y. I	Bruice, '	Organic Chemistry", 2011, 6th I	Edition, Pearson, Cha	apters 21-27.			

CHEM3443 Organic chemis	try laboratory (6 credits)	Academic Year	2015		
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				
Course Objectives	To provide students with intensive hands-on training of experiment reactions; and the opportunity to develop analytical and critical investigations in organic chemistry experiments. The course focuses of	ıl thinking skills thro	ough scientific		

			cluding and multistep synth scussed to give a holistic tr					
Course Contents & Topics	purificatio	The course will include the following laboratory skills and practices: laboratory safety practice; preparatio purification, and characterization of organic compounds; gas and liquid chromatography; ultraviolet-visib spectrophotometry; infrared spectroscopy; NMR spectroscopy and melting point determination						
Course Learning Outcomes	On succe	On successful completion of this course, students should be able to:						
			a good practice of labor usage of chemicals	ratory sa	fety and exercise pro	oper procedures for safe		
	CLO 2	carry out, rec	ord and analyze the results	of chem	ical experiments			
			rn instrumentation techni-	ques to	characterize organic	compounds and draw		
			the results of their work to	others				
	CLO 5	demonstrate	problem-solving skills, critic	cal thinkir	ng and analytical reaso	ning		
Pre-requisites (and Co-requisites and Impermissible combinations)	in this cou or before Pass in C Fundame CHEM344	urse; NOT fo 2014-2015 (HEM2441 C ntals of orga 42 Organic	Organic chemistry I; and page of students who have passe for students admitted in 20° Organic chemistry I or CHE inic chemistry for pharmacy chemistry of biomolecules 2015-16 or thereafter)	ed CHEM 14-15 or I M2442 F students	3441A in semester 1, pefore) undamentals of organic; and Pass in CHEM34	2015-16, or CHEM3441 in c chemistry or CHEM2443 141 Organic chemistry II or		
Offer in 2015 - 2016	Y 2nd	d sem			Examina	tion May		
Offer in 2016 - 2017	Υ				,	'		
Course Grade	A+ to F							
Grade Descriptors	A	attaining all to apply kn with efficier	e extensive knowledge and tho the course learning outcomes. Sh owledge to a wide range of comp it lab skills and techniques. Critics tive organizational and presentation	now strong lex, familia ally apprais	analytical and critical abilities and unfamiliar situations. C	and logical thinking, with ability competently conduct experiment		
	В	course lear analytical a situations.	e substantial command of a broad ning outcomes. Show substantial nd critical abilities and logical thi Show effective lab skills and te nal and presentational skills.	grasp and inking, and	mastery of the subject know ability to apply knowledge	ledge. Demonstrate evidence of to familiar and some unfamiliar		
	С	learning ou analytical a moderately	e general but incomplete comma tcomes. Show general but incom nd critical abilities and logical thir effective lab skills and technique trately effective organizational and	plete grasp nking, and es. Demon:	of the subject knowledge. ability to apply knowledge to strated some ability to analy	Demonstrate evidence of some most familiar situations. Show		
	D	Ability to re principles a limited anal	e partial but limited command of ecall some of factual information and weak ability to apply them. De ytical and critical abilities. Demons ganizational and presentational ski	of the sub Demonstrate strate partia	ect. Show a partial compre e evidence of some coheren	thension of basic concepts and not and logical thinking, but with		
	Fail	outcomes. and critical Demonstrat	e little or no evidence of comma Show evidence of little or no grasj abilities, logical and coherent thinl e minimally effective or ineffectiv ffective or ineffective.	p of the kno king. Show	owledge and understanding overy little or no ability to app	of the subject. Lack of analytical ly knowledge to solve problems.		
Course Type	Lecture w	ith laborator	y component course					
Course Teaching	Activitie	s		Details		No. of Hours		
& Learning Activities	Laborato	ry		12 x 4-	nr lab sessions	48		
	Tutorials	•				12		
	Reading	/ Self study				100		
Assessment Methods and Weighting	Methods	5	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examination		2 hrs written examination practical and oral exam (20%)	, , ,	40	CLO 1,2,3,4,5		
	Laboratory reports Lab report (20%);lab performance (20%)					CLO 1,2,3,4,5		
	Test				20	CLO 1,2,3,4,5		
Required/recommended reading		_ehman: Op latest editio	erational Organic Chemistry n)	y - A Pro	blem-Solving Approach	n to the Laboratory Course		
and online materials	1 '	ale	vo mondot-=: O(1 /		Note All ' :	and laboration		
Additional Course Information	pass this		re mandatory. Students m	usi com	nete ALL experiments	and laboratory reports to		

CHEM3541 Physical chemis	stry: Introduction to quantum chemistry (6 credits)	Academic Year	2015
Offering Department	Chemistry	Quota	80

Course Co-ordinator	Prof A S	C Cheung, C	hemistry (hrsccsc@hku.hk	:)				
Teachers Involved	Prof A S	of A S C Cheung, Chemistry						
Course Objectives		e course presents fundamental principles and topics on quantum chemistry in order to provide a s indation for students intending to further their studies in chemistry.						
Course Contents & Topics	quantum simple s electron	mechanics, ystems: parti atoms. Mole	mechanics: Historical deve Theory of angular mome cle in a box, harmonic osc ecular structure and chem valence bond theory, and	entum, H illator, rig iical bond	eisenberg uncertainty id rotator; Atomic structs. Approximation met	principle ture: Hy	e. Applications to drogen and many	
Course Learning Outcomes	On succ	essful comple	tion of this course, students	s should b	oe able to:			
	CLO 1	understand discussed in	and use the terminology the course	and no	menclature in quantu	m chem	istry and topics	
	CLO 2	demonstrate molecular str	knowledge and understand ucture	ding of ba	sic concepts in quantu	m mecha	anics, atomic and	
	CLO 3	understand e	elementary numerical proce ar systems	edures an	d the basic relationship	s of qua	intum mechanics	
	CLO 4	hands-on ex	perience of the application	of Hartree	e-Fock method to molec	ules		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	CHEM2541 Ir	ntroductory physical chemis	stry/Physic	cal chemistry I			
Offer in 2015 - 2016	Y 15	st sem			Examina	tion	Dec	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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 thorough grasp of the subject, 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.						
	В	course lear of the subj	e substantial command of a broac ning outcomes. Show evidence of ect, ability to apply knowledge to Correct use of data of results to c	nd critical abilities and logica d some unfamiliar situations	l thinking, a	and substantial grasp		
	С	learning ou incomplete	tcomes. Show evidence of some grasp of the subject, ability to app	and of knowledge and skills required for attaining most of the countries and critical abilities and logical thinking, and general ply knowledge to most familiar situations. Apply moderately effective the erroneous use of data and results to draw appropriate conclusions.				
	D	outcomes. partial but knowledge	Show evidence of some coherent limited grasp of the subject, re	and logical tention of s	ge and skills required for attaining some of the course learn al thinking, but with limited analytical and critical abilities. Sh of some relevant information of the subject, ability to ap lab skills and techniques. Limited ability to use data and res			
	Fail	outcomes. knowledge minimally	e little or no evidence of comma Lack of analytical and critical a and understanding of the subjec iffective or ineffective lab skills conclusions.	bilities, logiet, very little	cal and coherent thinking. or no ability to apply knowledge.	Show little edge to so	or no grasp of the olve problems. Apply	
Course Type	Lecture	with laborator	y component course					
Course Teaching	Activiti	es		Details			No. of Hours	
& Learning Activities	Lecture	s					24	
	Laborat	ory		24				
	Tutorial	s					6	
	Reading	g / Self study					100	
Assessment Methods	Method	Is	Details		Weighting in final course grade (%)		sment Methods to CLO Mapping	
and Weighting	Examination				70	C	CLO 1,2,3	
and Weighting	Examin				20	CI	04004	
and Weighting		ory reports	Experiment & Lab report		20		_O 1,2,3,4	
and Weighting		ory reports	Experiment & Lab report Test/Quiz		10		LO 1,2,3,4 CLO 1,2,3	
and Weighting Required/recommended reading and online materials	Laborat Test	:Quarrie: Qua						

CHEM3542 Physical checredits)	emistry: statistical thermodynamics and kinetics theory (6	Academic Year	2015
Offering Department	Chemistry	Quota	40
Course Co-ordinator	Dr H Hu, Chemistry (haohu@hku.hk)		

Teachers Involved		, Chemist							
Course Objectives	order to	The course presents fundamental principles and topics on statistical thermodynamics and kinetic theory order to provide a solid foundation for students intending to further their studies in physical chemistry a related fields.							
Course Contents & Topics	Principles of Statistical Thermodynamics - Thermodynamic laws - Ensembles and partition functions: microcanonical, canonical and grand-canonical - Systems of independent molecules: ideal gas - Molecular degrees of freedom: translation, rotation, vibration, and electronic - Ideal gas mixture: chemical equilibrium, binding, and titration - Lattice statistics: Ising model and phase transition - Quantum statistics								
			um and kinetics theory ision theory, transition state theo	ry					
Course Learning Outcomes	On succ	essful cor	mpletion of this course, students	shou	uld be able to:				
	CLO 1		nd and use the terminology and d in the course	l nor	nenclature in statistical	thermodyr	namics and topics		
	CLO 2	demonst	rate knowledge and understandir	ng of	basic concepts in statis	stical therm	odynamics		
	CLO 3	understa systems	nd correlation between macros	scop	ic observables and m	icroscopic	statistical model		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	Pass in CHEM2541 Introductory physical chemistry/Physical chemistry I							
Offer in 2015 - 2016	Y 2	nd sem			Examin	ation	May		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	В	Demonstrate evidence of strong analytical / critical abilities and logical thinking. Can apply the knowledge to practiquestions in Physical Chemistry.							
	С	Genera		ledge of statistical thermodynamics and reaction dynamics. Demonstrate he knowledge to familiar situations.					
	evidence of analytical thinking. Can apply the knowledge to familiar situations. Partial but limited command of knowledge of knowledge of statistical thermodynamics and reaction dynam Demonstrate limited evidence of analytical thinking. Understand the question to be solved with knowledge.								
	Fail Little or no evidence of command of knowledge of statistical thermodynamics and reaction dynamics.					mics.			
Course Type	Lecture	with labor	atory component course						
Course Teaching	Activit	ies		Det	ails		No. of Hours		
& Learning Activities	Lecture	es					24		
	Labora	tory					24		
	Readin	g / Self st	udy				100		
Assessment Methods and Weighting	Method	ds	Details		Weighting in final course grade (%)		ssment Methods to CLO Mapping		
	Assigni	ments	continuous assessment of class quizzes & assignments	on	40	CL	O 1,2,3		
	Examir	ation			60	CL	O 1,2,3		
Required/recommended reading and online materials			duction to Statistical Thermodyna Il Chemistry	amic	S				
Course Website	Nil								
Additional Course Information	Laborate	ory classe	es are mandatory. Students mu	ist c	omplete ALL experimer	nts and lab	ooratory reports t		

CHEM3999 Directed studi	es in chemistry (6 credits)	Academic Year	2015				
Offering Department	Chemistry	Quota					
Course Co-ordinator	Prof D L Phillips, Chemistry (phillips@hku.hk)						
Teachers Involved	Various teachers in the Department, Chemistry	Various teachers in the Department, Chemistry					
Course Objectives	This course is designed for third year students who would like to tak offers students an opportunity to carry out small scale chemical project	e an early experience cts by themselves.	on research. It				
Course Contents & Topics	Students interested in taking this course should contact their prospe the contents and the nature of their project in the coming academ prospective supervisor and the course coordinator is required.	d in taking this course should contact their prospective supervisors in May to determine the nature of their project in the coming academic year. Prior approval from both the					

Course Learning Outcomes	On succe	essful co	mpletion of this course, students	should be able to:						
	CLO 1 understand the terminology and nomenclature associated with the small scale chemical project they worked on in the course									
	CLO 2	demonst	rate knowledge and understandi	ng of basic concepts	involved in the	ir chemical project				
	CLO 3	understa	and the relationships of the their p	particular chemical p	roject to the wid	der area of chemistry				
Pre-requisites (and Co-requisites and Impermissible combinations)	CHEM4X Organic of chemistry This caps This cour	Pass in at least 24 credits of advanced level disciplinary core/elective chemistry courses (CHEM3XXX of CHEM4XXX) in the Chemistry Major including a pass in CHEM2341 Inorganic chemistry I or CHEM244 Organic chemistry I or CHEM2442 Fundamentals of organic chemistry or CHEM2541 Introductory physic chemistry/Physical chemistry I or CHEM3146 Principles and applications of spectroscopic techniques. This capstone course is for Chemistry Major 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 2015 - 2016	Y 2n	d sem			Examination	No Exam				
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	A Show an extensive comprehension of the subject. Demonstrate very able analytical and critical thought with presence of some originality. Illuminating utilization and critical analysis / evaluation of information acquired from a wide range of high quality sources. Critical employment of data and results to synthesize appropriate and illuminating conclusions. Demonstrate integration of a wide range of appropriate theories, principles, data and methods. Employ very effective organizational and presentational skills. [Work of A+ should demonstrate substantial additional work beyond that is required in wider areas relevant to the topic.]									
	B Show a substantial comprehension of the subject. 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.									
	C 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.									
	D 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 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.									
Course Type	Project-b	ased cou	ırse							
Course Teaching & Learning Activities	Activitie	es		Details		No. of Hours				
& Learning Activities	Reading / Self study			discussion & me						
	Reading	j / Self st	udy	arranged by the str supervisor	U	96				
Assessment Methods and Weighting	Reading		Details	arranged by the st	inal A	96 ssessment Methods to CLO Mapping				
		s	,	arranged by the st supervisor Weighting in f course grade	inal A	ssessment Methods				
	Method Disserta	s	Details including a written report and	arranged by the st supervisor Weighting in f course grade	inal (%)	ssessment Methods to CLO Mapping				

CHEM4142 Symmetry, gro	up theor	y and applications	(6 credits)	Academic Year	2015				
Offering Department	Chemis	Chemistry Quota 60							
Course Co-ordinator	Prof V \	V W Yam, Chemistry (v	vwyam@hku.hk)						
Teachers Involved		Prof V W W Yam, Chemistry Prof C M Che, Chemistry							
Course Objectives	problem and vib	To introduce the concepts of symmetry and group theory and to apply them in solving chemic problems. This course also provides an introductory treatment of bonding theories, inorganic electror and vibrational spectroscopy. This course is essential for students who wish to take advanced courses inorganic chemistry and all types of spectroscopy.							
Course Contents & Topics	represe operato	Symmetry elements and symmetry operations; symmetry point groups; reducible and irreducible representations; character tables; direct products; symmetry-adapted linear combinations; projectic operators; hybrid orbitals; molecular orbital theory for organic, inorganic and organometallic system selected applications in electronic and vibrational spectroscopy.							
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 understand the basic principles and concepts of symmetry and group theory and to apply them in solving chemical problems								

	CLO 2	demons techniqu	trate knowledge and understand les	ling in the use of char	racter tables a	and projection operator			
	CLO 3		trate knowledge and understal ar orbitals for organic, inorganic			g hybrid orbitals and			
	CLO 4		trate knowledge and understan ic and vibrational spectroscopy	ding in the applicatio	n of symmetr	y and group theory in			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	Pass in CHEM3341 Inorganic chemistry II							
Offer in 2015 - 2016	Y 19	st sem			Examinatio	n Dec			
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	symmelement tables include electron the bary vibrate result.	onstrate thorough knowledge and under- netry and group theory and their applicated and symmetry operations; symme- s; direct products; symmetry-adapted li- ling hybrid orbitals and molecular orbita- onic and vibrational spectroscopy. Sho- asic principles and concepts of symmetri- onal spectroscopy. Show strong ability s to draw appropriate and insightful con- treory.	ions in solving chemical pr try point groups; reducible near combinations; projecti als for organic, inorganic an w strong ability to apply an y and group theory and the to analyze novel problem	oblems, especialle and irreducible and irreducible ion operators; trend orgametallic sid integrate knower applications in and critical us	y those related to symmetry representations; character atment of bonding theories systems; and applications in ledge and theory relating to bonding, and electronic and e of data and experimental			
	В								
	Demonstrate general but incomplete 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 an irreducible representations; character tables; direct products; symmetry-adapted linear combinations; projectio operators; treatment of bonding theories including hybrid orbitals and molecular orbitals for organic, inorganic an orgametallic systems; and applications in electronic and vibrational spectroscopy. Show evidence of some abilities t apply and integrate knowledge and theory relating to the basic principles and concepts of symmetry and group theor and their applications in bonding, and electronic and vibrational spectroscopy. Show ability to analyze problems t most familiar situations and mostly correct but erroneous use of data and experimental results to draw appropriat 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 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 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	Demo princi especi irredu opera organ abiliti group analy	onstrate little or no evidence of comples, and theories relating to symmetry cially those related to symmetry elemetible representations; character tables tors; treatment of bonding theories incenetallic systems; and applications in eas to apply and integrate knowledge and theory and their applications in bonding ze problems to most familiar situations is usions relating to the principles and applications are problems.	nand of knowledge and and group theory and the nts and symmetry operatis; direct products; symmet uding hybrid orbitals and electronic and vibrational s d theory relating to the bard, and electronic and vibrational s drone or of data	understanding of ir applications in ions; symmetry p etry-adapted linear molecular orbitals spectroscopy. Sh sic principles and ional spectroscop and experimental	solving chemical problems, point groups; reducible and ar combinations; projection is for organic, inorganic and ow little or no evidence of I concepts of symmetry and by. Show little or no ability to			
Course Type	Lecture-	based co	ourse						
Course Teaching	Activiti			Details		No. of Hours			
& Learning Activities	Lecture			Dotano		36			
	Tutorial			or discussion		12			
		g / Self s	tudy			100			
Assessment Methods and Weighting	Method		Details	Weighting in course grade		Assessment Methods			
-	Assignr	nents	(continuous assessment)	Jourse grade	25	CLO 1,2,3,4			
	Examin		(CONTRIBUTED & SOCIONIE)		75	CLO 1,2,3,4			
Required/recommended reading and online materials			mical Applications of Group The	ory (Wiley, 3rd ed., 19		0.00 1,2,0,4			

CHEM4143 Interfacial sci	ence and technology (6 credits)	Academic Year	2015
Offering Department	Chemistry	Quota	50
Course Co-ordinator	Prof G K Y Chan, Chemistry (hrsccky@hku.hk)		

Teachers Involved	Prof G K Y Chan, Chemistry Guest lecturer, Chemistry							
Course Objectives		To understand the science and technology of interfacial phenomena and processes often appeared in hig value added products and modern technologies.						
Course Contents & Topics		Physics and Chemistry of Interfaces: coatings and surfactants, colloids and interfaces, wetting microemulsion, thin films, nanomaterials, porous materials.						
Course Learning Outcomes	On success	ful con	npletion of this course, students	should	be able to:			
	CLO 1 und	derstar	nd interfacial phenomena and t	neir origi	in from molecul	lar details		
			blems in interfacial science and namics, and kinetics	l technol	logy by applyin	g knowledg	ge of gen	eral chemistry,
			arized with technologies tha erials, nanotechnology, deterge					nce, including
Pre-requisites (and Co-requisites and Impermissible combinations)			541 Physical chemistry: intr intum chemistry	oduction	to quantum	chemistry	/Physica	chemistry II:
Offer in 2015 - 2016	Y 2nd s	em			E	Examinatio	n	May
Offer in 2016 - 2017	N							
Course Grade	A+ to F							
Grade Descriptors	A	A Demonstrate thorough knowledge of interfacial 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.						
	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 requ for attaining the course learning outcomes. Lack of analytical and critical abilities, logical and coherent thinking. S very little or no ability to apply knowledge to solve problems. Misuse of data and references. Organization presentational skills are minimally effective or ineffective.					ent thinking. Show		
Course Type	Lecture-bas	ed cou	ırse					
Course Teaching	Activities			Details	S			No. of Hours
& Learning Activities	Lectures							36
	Tutorials			or disc	ussion			12
	Reading / S	Self stu	ıdy				100	
Assessment Methods and Weighting	Methods		Details		Veighting in fi course grade (nent Methods CLO Mapping
	Assignmen	ts	(continuous assessment)			5	CLO	1,2,3
	Examinatio	n				70	CLO	1,2,3
	Test		test/quiz			25	CLO	1,2,3
Required/recommended reading	Barnes and	Test test/quiz 25 CLO 1,2,3 Barnes and Gentle: Interfacial Science						
and online materials								

CHEM4144 Advanced mat	erials (6 credits)	Academic Year	2015				
Offering Department	Chemistry	Quota 50					
Course Co-ordinator	Prof W K Chan, Chemistry (waichan @hku.hk)						
Teachers Involved	Prof W K Chan, Chemistry Dr J Y Tang, Chemistry						
Course Objectives	This course is a continuation from Introdution to Materials Chemistroverview on materials chemistry and application of materials in addevelopment in materials chemistry will also be discussed.						
Course Contents & Topics	Advanced polymerization methods: copolymerization and applic polymerization, control of stereochemistry in polymers; ionic and radio specialty applications: high strength materials; high temperature polymers.	cal living polymerization	n. Materials for				

			I information storage, senso erization techniques.	ors, photonics, elec-	tronics, nanotech	nology. Advanced				
Course Learning Outcomes	On successful completion of this course, students should be able to:									
	CLO 1	CLO 1 describe the mechanisms and kinetics of copolymerizations, coordination polymerizations, and living polymerizations								
	CLO 2	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	demonst	rate knowledge in advanced ma	aterials characterizati	on techniques					
	CLO 4	understa application	nd the working principles of ons	materials for inform	nation storage a	nd opto-electronic				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	Pass in CHEM3143 Introduction to materials chemistry								
Offer in 2015 - 2016	Y 2	nd sem			Examination	May				
Offer in 2016 - 2017	Y									
Course Grade	A+ to F									
Grade Descriptors	A	frontie techno applica	nstrate thorough knowledge and under r approach in polymer synthesis, prology. Show strong ability to apply ations of advanced materials. Show semental results to draw appropriate and ties.	operties, application, and and integrate knowledge strong ability to analyze r	characterization of r and theory relating novel problems and c	naterials for advanced to the synthesis and ritical use of data and				
	В	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	princip charac knowle proble	Demonstrate general but incomplete command of knowledge and understanding of essential facts, concept principles, and theories relating to frontier approach in polymer synthesis, properties, application, ar characterization of materials for advanced technology. Show evidence of some abilities to apply and integra knowledge and theory relating to the synthesis and applications of advanced materials. Show ability to analyz problems to most familiar situations and mostly correct but erroneous use of data and experimental results to dra appropriate conclusions relating to advanced materials synthesis and their properties.							
	D	Demonstrate partial but limited 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 of limited abilities to apply and integrate knowledge and theory relating to the synthesis and applications of advanced materials. 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 advanced materials synthesis and their properties.								
	Fail Demonstrate little or no evidence of 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 little or no evidence of abilities to apply and integrate knowledge and theory relating to the synthesis and applications of advanced materials. 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 advanced materials synthesis and their properties.									
Course Type	Lecture-	based co	urse							
Course Teaching	Activit	ies		Details		No. of Hours				
& Learning Activities	Lecture					36				
	Tutoria	ls		or discussion		12				
	Readin	g / Self st	udy			100				
Assessment Methods and Weighting	Method	ds	Details	Weighting in course grade		essment Methods to CLO Mapping				
	Assigni	ments	(continuous assessment)		` /	O 1,2,3,4				
	Examir		,			O 1,2,3,4				
Required/recommended reading and online materials			es of Polymerizations (John Wi eferences will be given through		,					

CHEM4145 Medicinal che	mistry (6 credits)	Academic Year	2015			
Offering Department	Chemistry	Quota 70				
Course Co-ordinator	Prof H Z Sun, Chemistry (hsun@hku.hk)					
Teachers Involved	Prof H Z Sun, Chemistry Dr X C Li, Chemistry					
Course Objectives	This course covers the chemical principles of drug design and drug research in areas of bioorganic chemistry, bioinorganic chemistry, chemistry, and biotechnology.					
Course Contents & Topics	 Drug discovery, design, and development: lead discovery, pharmac (SAR), computer-aided drug design, combinatorial chemistry and high - Drug-receptor interactions Proteins (and enzymes) and nucleic acids as drug targets 					

	- Metals ir - DNA-Dru - Drug me	ug intera		ry						
Course Learning Outcomes	On successful completion of this course, students should be able to:									
	CLO 1	demo	onstrate knowledge of drug disc	overy,	design and developmen	t				
	CLO 2	unde	rstand drug-biomolecule interac	tions v	where appropriate					
	CLO 3	gain a	appropriate knowledge of drug i	metab	olism and drug delivery					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in C	ass in CHEM3441 Organic chemistry II or CHEM3442 Organic chemistry of biomolecules								
Offer in 2015 - 2016	Y 2nd	d sem			Exami	nation	May			
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	A	the badevelous its relation foundation and experience of me	nstrate thorough knowledge and under asic foundation knowledge of medicir opment; drug targets; drug lead optimiz evance to toxicity. Show strong abilit tion knowledge of medicinal chemistry xperimental results to draw appropriate dicinal chemistry. Demonstrate highly rery and metabolism.	nal cher ation; si ty to ap y. Show and ins	nistry, especially those relate tructure activity relationship; phoply and integrate knowledge strong ability to analyze nove eightful conclusions relating to the control of the conclusions relating to the control of the conclusions relating to the control of t	d to drug of narmacokine and theory I problems a he basic prir	liscovery, design and tics; drug delivery and relating to the basic and critical use of data aciples and knowledge			
	В	B Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of medicinal chemistry; especially those related to drug discovery; design and development; drug targets; drug lead optimization; structure activity relationship; pharmacokinetics; drug delivery and its relevance to toxicity. Show evidence to apply and integrate knowledge and theory relating to the basic foundation knowledge of medicinal 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 medicinal chemistry. Demonstrate effective basic techniques for medicinal chemistry, especially in drug discovery and metabolism.								
	Demonstrate general but incomplete command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of medicinal chemistry; especially those related to drug discovery; design and development; drug targets; drug lead optimization; structure activity relationship; pharmacokinetics; drug delivery and its relevance to toxicity. Show evidence of some abilities to apply and integrate knowledge and theory relating to the basic foundation knowledge of medicinal 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 medicinal chemistry. Demonstrate moderately effective basic techniques, basic techniques for medicinal chemistry, especially in drug discovery and metabolism.									
	Demonstrate partial but limited command of knowledge and understanding of essential facts, concepts, principles, and theories relating to the basic foundation knowledge of medicinal chemistry; especially those related to drug discovery; design and development; drug targets; drug lead optimization; structure activity relationship; pharmacokinetics; drug delivery and its relevance to toxicity. Show evidence of limited abilities to apply and integrate knowledge and theory relating to the basic foundation knowledge of medicinal 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 basic principles and knowledge of medicinal chemistry. Demonstrate partially effective basic techniques for medicinal chemistry, especially in drug discovery and metabolism.									
	Fail	princip drug pharm integra ability appro	nstrate little or no evidence of com- oles, and theories relating to the basic discovery; design and development; nacokinetics; drug delivery and its rela- te knowledge and theory relating to the to analyze problems to most familiar priate conclusions relating to the basic ve basic techniques for medicinal chem	foundati drug t evance ne basio situation principle	on knowledge of medicinal che argets; drug lead optimization to toxicity. Show little or no do foundation knowledge of medicinal as and erroneous use of data as and knowledge of medicinal	emistry; espensive; structure evidence of dicinal chem and experir chemistry. E	ecially those related to activity relationship; abilities to apply and istry. Show little or no nental results to draw Demonstrate minimally			
Course Type	Lecture-b	ased co	urse							
Course Teaching	Activitie			Deta	aile		No. of Hours			
& Learning Activities				Deta	alio					
	Lectures			6 m -l	inguasion		36			
	Tutorials		u du	or a	iscussion		12			
	Reading	, seit st	uuy				100			
Assessment Methods and Weighting	Methods	•	Details		Weighting in final course grade (%)		ssment Methods to CLO Mapping			
	Assignm	ents	(continuous assessment)		25	CL	O 1,2,3			
	Examina	tion			75	CL	O 1,2,3			
Required/recommended reading and online materials	Medicinal	Chemis	stry- An Introduction, G. Thoma	s, Johi	Examination 75 CLO 1,2,3 An Introduction to Medicinal Chemistry (3/e), G.L. Patrick, Oxford University Press, 2005 Medicinal Chemistry- An Introduction, G. Thomas, John Wiley, 2000 D. Wang, S.J. Lippard (2004) Nat. Rev. Drug Dis., Cellular processing of platinum anticancer drugs, 4, 307					

CHEM4241 Modern chemical instrumentation and applications (6 credits)		Academic Year	2015
Offering Department	Chemistry	Quota	50
Course Co-ordinator	Dr I K Chu, Chemistry (ivankchu@hku.hk)		
Teachers Involved	Dr I K Chu, Chemistry Dr W T Chan, Chemistry		

Course Objectives	fundamer	The aim of the course is to provide an understanding of modern instrumentation, covering bot fundamental principles and practical aspects of instrument design. The course will be of particular bene to those pursuing a higher research degree or a career in technical sales/service.				
Course Contents & Topics	Biological Mass spectrometry: Liquid Chromatography-Tandem Mass Spectrometry for Proteomi Metabolomics. Laser Spectroscopy: Principle of laser; three-level and four-level lasers; laser instrumentation (Q-switt and frequency conversion); laser-induced fluorescence; laser atomic spectrometry; laser remote ser signal-to-noise enhancement by boxcar integration and photon counting. Atomic Plasma Spectrometry: Inductively couple plasma-atomic emission spectrometry (ICP-AES) mass spectrometry (ICP-MS); signal-production processes in ICP spectrometry; Echelle gr spectrometer; array detectors; interferences in ICP-AES and ICP-MS. Atomic X-ray Spectrometry: x-ray fluorescence; wavelength-dispersive (WDXRF) and energy-disper (EDXRF) X-ray fluorescence spectrometers					ntation (Q-switchin er remote sensing try (ICP-AES) an c; Echelle gratin
Course Learning Outcomes	On succe	ssful cor	mpletion of this course, students	s should be able to:		
			he principles of the modern mation and quantification	ass spectrometric methods	for proteins	s and metabolites
			now proteins are identified and cs experiments	sequenced experimentally	and how da	ta is generated ir
		use the d	database searching techniques	and software tools to analyz	e high-throu	ughput proteomics
	CLO 4	apply LC	/MS/MS method for target quan	titative analysis of small mo	lecules	
		explain t	he principles of the laser spect	roscopy, atomic plasma sp	ectrometry,	and atomic x-ray
	CLO 6	describe	the basic experimental set units used in the laboratory classes		ne basic co	omponents of the
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in C	HEM32	41 Analytical chemistry II: chem	ical instrumentation		
Offer in 2015 - 2016	Y 1st	sem		Exam	ination	Dec
Offer in 2016 - 2017	Υ					
Course Grade	A+ to F					
Grade Descriptors	В	Demonstrate thorough knowledge and understanding of essential facts, concepts, principles and theories relatin the modern chemical instrumentations and applications. Show strong ability to apply and integrate knowledge theory, and strong ability to analyze problems related to fundamental principles and practical aspects of instrum design. Demonstrate substantial command of knowledge and understanding of essential facts, concepts, principles theories relating to the modern chemical instrumentations and applications. Show evidence to apply and integ knowledge and theory, and ability to analyze problems related to fundamental principles and practical aspect				
	instrument design. C Demonstrate general but incomplete c principles and theories relating to the minimum.			command of knowledge and understanding of essential facts, concepts modern chemical instrumentations and applications. Show evidence of som reledge and theory, and to analyze problems to most familiar situations to		
	D Demonstrate partial but limited comman and theories relating to the modern chen			and of knowledge and understanding of essential facts, concepts, principle emical instrumentations and applications. Show evidence of limited abilities t eory, and limited ability to analyze problems to most familiar situations relate		
	Fail Demonstrate little or no evidence of occoprinciples and theories relating to the moo of abilities to apply and integrate knowled situations related to fundamental principles			chemical instrumentations and ap and theory, and little or no ability	plications. Sho to analyze pro	ow little or no evidence
Course Type	Lecture w	ith labor	ratory component course			
Course Teaching	Activitie	s		Details		No. of Hours
& Learning Activities	Lectures					24
	Laborato	ory				16
	Tutorials					12
	Reading / Self study					100
Assessment Methods and Weighting	Methods	5	Details	Weighting in final course grade (%)	Asse	essment Methods to CLO Mapping
	Assignm	ents	(continuous assessment)	30	CLO	1,2,3,4,5,6
	Examina	tion		70	CLC	0 1,2,4,5,6
Required/recommended reading and online materials			ndamentals of contemporary ma Holler, S.R. Crouch: Principles of			st edition)
Additional Course Information		y classe	ished material will be made throes are mandatory. Students m		ents and lal	boratory reports t

CHEM4242 Analytical chem Offering Department	Chemistry	 /			Academi Quota		2015 50	
Course Co-ordinator		Chamietr	y (kwanmng@hku.hk)		Quota		30	
Course Co-ordinator Feachers Involved	Dr K M Ng		, , ,					
Course Objectives	This cours analysis. I practical a	This course focuses on the basic principle, practice and methodology in chemical and biochemical analysis. The course emphasizes on the integration of analytical concepts and technologies to solv practical analytical and bioanalytical problems. This course will be particularly useful for students who plate to pursue their career related to analytical and bioanalytical chemistry.						
Course Contents & Topics	Analytical Figures of	measuren merits of	nent concepts: Statistical analytical methods; Valid	treatment	: & evaluation of cher			
	Theoretica preparation Advanced methods to detection to	I backgroun and enr separation for chrom echniques	aboratories and and practical technique ichment techniques for bi technologies for compley atographic analysis and based on mass spectrome	omedical, mixture a spectroso etry	pharmaceutical and for nalysis (e.g. multidimer copic detection; Analy	rensic ch nsional L0 rtes chara	emical analysi c); Derivatizatio acterization ar	
	practical k	nowledge	gn of analytical strategy and experience related titerature/ scenario.					
Course Learning Outcomes	On succes	sful compl	etion of this course, studer	nts should	be able to:			
			tical methods to assess, validate analytical method			uality and	I interpret thei	
			e understanding on the eir advantages and limitat		rinciple of different a	nalytical 1	echniques and	
	CLO 3 in	tegrate dif	ferent analytical technique	s to solve a	analytical and bioanalyti	cal proble	ms	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in C analysis	HEM3241	Analytical chemistry II:	chemical	instrumentation or CHI	EM3242	Food and wate	
Offer in 2015 - 2016	Y 2nd	sem			Examina	tion	May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required course learning outcomes. Show strong analytical and critical abilities, logical thinking and knowledge learnt to solve a wide range of complex issues and problems related to chemical at effective organization and presentation skills as shown in class work. B Demonstrate a substantial command of a broad range of knowledge and skills required for attain the course learning outcomes. Show evidence of analytical and critical abilities, logical thinking apply knowledge learnt to solve a wide range of complex issues and problems related to chemical strong the course learning outcomes.						capability to appl alysis. Apply highl ing at least most of g, and capability t	
	effective organization and presentation skills as shown in class work. C Demonstrate a general command of knowledge and skills required outcomes. Show evidence of analytical and critical abilities, logical thir solve a wide range of complex issues and problems related to chemi presentation skills as shown in class work.					uired for attaining most of the course learning thinking, and ability to apply knowledge learnt to		
	D	Demonstrate a partial but limited command of knowledge and skills required for attaining some of the course let outcomes in Food and Water Analysis. Show evidence of some coherent and logical thinking, but with I analytical and critical abilities. Show limited ability to apply knowledge to solve problems related to chemical and Apply limited or barely effective organization and presentation skill as shown in class work.						
	Fail	outcomes. knowledge	ate little or no evidence for the contact Lack of analytical and critical at the to solve problems related to rineffective as shown in class work.	ilities, logical chemical ar	and coherent thinking. Show	very little c	r no ability to appl	
Course Type	Lecture wit	h laborato	ry component course					
Course Teaching & Learning Activities	Activities			Details	Details		No. of Hours	
Learning Activities	Lectures						24	
	Laborator	У		6 x 4-h	our of laboratory practic	al	24	
	Tutorials			71				
	Reading / Self study						10	
Assessment Methods and Weighting	Methods		Details	'	Weighting in final course grade (%)		ment Method CLO Mappin	
	Examinati	on			70	CL	O 1,2,3	
	Laborator	y reports	Experiment & Lab repor	t	15		LO 1,2	
	Presentati	•			5		O 1,2,3	
	Test		Test/Quiz		10		O 1,2,3	
Required/recommended reading		•	West, F.J. Holler, S.R. (Crouch: Fu				

Additional Course Information	References to specialist texts and other published materials will be made throughout the course.
	Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports to
	pass this course.

CHEM4341 Advanced inorg	janic che	emistry	(6 credits)		Academic Y	ear	2015
Offering Department	Chemist	ry			Quota		60
Course Co-ordinator	Prof C M	1 Che, Ch	emistry (cmche@hku.hk)				
Teachers Involved	Prof V V	Prof C M Che, Chemistry Prof V W W Yam, Chemistry Prof H Z Sun, Chemistry					
Course Objectives	treatmer advance	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	multiple	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 Outcomes	On succ	essful co	mpletion of this course, students	should be able to:			
	CLO 1	understa	nd the principles and concepts	of inorganic and supra	molecular ph	otoche	mistry
		understa	nd the electronic structure and metal complexes		•		•
	CLO 3	realize th	nd and realize the activation ne importance of such activation gy saving reactions				
	CLO 4	understa	nd the role of metal complexes	in bio-inorganic and m	nedicinal cher	nistry	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	CHEM33	41 Inorganic chemistry II				
Offer in 2015 - 2016	Y 19	st sem			Examination	1	Dec
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	В	the from ability skills. Demo theorie knowled	ontiers in inorganic chemistry. Show st to analyze novel problems in inorgan instrate substantial command of knowless relating to the more advanced knowledge and theory, and ability to analyze	standing of essential facts, concepts, principles and theories relating to trong ability to apply and integrate knowledge and theory, and strong inc chemistry. Apply highly effective organizational and presentational eledge and understanding of essential facts, concepts, principles and wledge in inorganic chemistry. Show evidence to apply and integrate novel problems of inorganic chemistry. Apply effective organizational			
	С	Demo princip abilitie	oles and theories relating to the more	and of knowledge and understanding of essential facts, concepts advanced knowledge in inorganic chemistry. Show evidence of som theory, and to analyze problems to most familiar situations in inorganitional and presentational skills.			evidence of some
	D	Demo and th apply	nstrate partial but limited command of leories relating to the more advanced land integrate knowledge and theory,	knowledge and understanding of essential facts, concepts, principles nowledge in inorganic chemistry. Show evidence of limited abilities to and limited ability to analyze problems to most familiar situations in ctive organizational and presentational skills.			
	Fail Demonstrate little or no evidence of command of knowledge and understanding of essential fact principles and theories relating to the more advanced knowledge in inorganic chemistry. Show little or no abilities to apply and integrate knowledge and theory, and little or no ability to analyze problems to situations in inorganic chemistry. Demonstrate minimally effective organizational and presentational skills						e or no evidence of ms to most familiar
Course Type	Lecture-	based co	urse				
Course Teaching	Activiti	es		Details			No. of Hours
& Learning Activities	Lecture	s					36
	Tutorial	s		including literature presentation	survey 8		12
	Reading	g / Self st	udy				100
Assessment Methods and Weighting	Method	ls	Details	Weighting in f			ment Methods CLO Mapping
	Assignments		(continuous assessment)		20	CLO 1,2,3,4	
	Examin	ation			80	CLO	1,2,3,4
Required/recommended reading and online materials	F.A. Cot	ton, G. W	filkinson, Hurillo and Bochmann	Advance Inorganic C	hemistry (Wil	ey, 199	99, 6th ed.)
Additional Course Information	(Student		ecialist texts and other published ongly recommended to take CH course.)				

O#==!== D================================		try (6 credits)	Academic Year	40				
Offering Department	Chemist	•	Quota	40				
Course Co-ordinator		V W Yam, Chemistry (wwyam@hku.hk)						
Teachers Involved		V W Yam, Chemistry Au-Yeung, Chemistry						
Course Objectives	Chemist	Fo give further, more detailed, treatment to organometallic chemistry mentioned in CHEM3341 Inorga Chemistry II. The course also aims to introduce and familiarize students with advanced laborat echniques, and to prepare students for graduate work in inorganic and organometallic chemistry.						
Course Contents & Topics	structure catalysis Laborate	Lectures: Main group and transition metal organometallics. Transition metal cluster chemistry structure and reactivities of organometallics. Application of organometallics in organic syncatalysis. Laboratory: To introduce and familiarize students with advanced laboratory techniques which synthesis and manipulation of air- and moisture- sensitive compounds, and their characters.						
	various	various spectroscopic methods.						
Course Learning Outcomes	On succ	essful completion of this course, students should be able to	0:					
		understand the advanced principles and concepts in organ	•					
	CLO 2	demonstrate knowledge and understanding in the bond group and transition metal organometallics, especially in metal alkylidenes and metal alkylidynes						
	CLO 3	demonstrate knowledge and understanding in the app synthesis, polymerization and catalysis	plication of organometa	illics in organ				
	CLO 4	demonstrate ability in advanced laboratory techniques in of air- and moisture- sensitive compounds, and their ch methods						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	Pass in CHEM3341 Inorganic chemistry II						
Offer in 2015 - 2016	Y 1:	st sem	Examination	Dec				
Offer in 2016 - 2017	Y		·					
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough knowledge and understanding of essential father more detailed and advanced treatment of organometallic chemic and reactivities of main group and transition metal organometallics; of organometallics in organic synthesis and catalysis. Show stro	istry, especially those related to transition metal cluster chemis	o structure, bondi				
		theory relating to the advanced principles and concepts of organor novel problems and critical use of data and experimental results relating to the advanced principles and applications of organor advanced laboratory skills and techniques, especially in the sy sensitive compounds and their characterization by various spectrosc	metallic chemistry. Show stror s to draw appropriate and in- metallic chemistry. Demonstry inthesis and manipulation of	ng ability to analy sightful conclusio ate highly effecti				
	В	theory relating to the advanced principles and concepts of organor novel problems and critical use of data and experimental results relating to the advanced principles and applications of organor advanced laboratory skills and techniques, especially in the sy	metallic chemistry. Show strors to draw appropriate and in: metallic chemistry. Demonstr: mthesis and manipulation of copic methods. ding of essential facts, conce ganometallic chemistry, especi methods and catalysis. Show evides and concepts of organometal and experimental results to forganometallic chemistry. Demonstration of metal organometal and experimental results to forganometallic chemistry. Demonstration of manipulation of	ng ability to analy sightful conclusio ate highly effecti air- and moistur pts, principles, ar alally those related sition metal clust lence to apply ar lilic chemistry. Sho o draw appropria emonstrate effecti				
	С	theory relating to the advanced principles and concepts of organor novel problems and critical use of data and experimental results relating to the advanced principles and applications of organor advanced laboratory skills and techniques, especially in the sy sensitive compounds and their characterization by various spectrosometries relating to the more detailed and advanced treatment of organor structure, bonding and reactivities of main group and transition chemistry; and application of organometallics in organic synthesintegrate knowledge and theory relating to the advanced principles evidence to analyze novel problems and correct use of data conclusions relating to the advanced principles and applications of advanced laboratory skills and techniques, especially in the sy	metallic chemistry. Show stror s to draw appropriate and insmetallic chemistry. Demonstranthesis and manipulation of copic methods. Iding of essential facts, conce ganometallic chemistry, especial metal organometallics; transis and catalysis. Show evides and concepts of organometal and experimental results to forganometallic chemistry. Deworthesis and manipulation of copic methods. In the analysis and manipulation of copic methods. In the analysis and transition metal organoganic synthesis and catalysis, ting to the advanced principle most familiar situations and te conclusions relating to the alerately effective advanced lessential treately effective advanced lessential transition metal organoganic synthesis and catalysis.	ng ability to analy sightful conclusion ate highly effecti air- and moisture pts, principles, a sially those related sition metal clus lence to apply a lic chemistry. Sho or draw approprize emonstrate effecti air- and moisture iail facts, concep hemistry, especia emetallics; transiti Show evidence so and concepts mostly correct te advanced principl aboratory skills a				
		theory relating to the advanced principles and concepts of organor novel problems and critical use of data and experimental results relating to the advanced principles and applications of organor advanced laboratory skills and techniques, especially in the sy sensitive compounds and their characterization by various spectross. Demonstrate substantial command of knowledge and understance theories relating to the more detailed and advanced treatment of org structure, bonding and reactivities of main group and transition chemistry; and application of organometallics in organic synthesi integrate knowledge and theory relating to the advanced principles evidence to analyze novel problems and correct use of data conclusions relating to the advanced principles and applications of advanced laboratory skills and techniques, especially in the sy sensitive compounds and their characterization by various spectross. Demonstrate general but incomplete command of knowledge a principles, and theories relating to the more detailed and advanced those related to structure, bonding and reactivities of main group metal cluster chemistry; and application of organometallics in organometallic chemistry. Show ability to analyze problems to erroneous use of data and experimental results to draw appropriat and applications of organometallic chemistry. Demonstrate mod techniques, especially in the synthesis and manipulation of air-	metallic chemistry. Show stror s to draw appropriate and insmetallic chemistry. Demonstrunthesis and manipulation of copic methods. ding of essential facts, conce ganometallic chemistry, especial metal organometallics, transis and catalysis. Show evides and concepts of organometal and experimental results to forganometallic chemistry. Demonstration of copic methods. and understanding of essential treatment of organometallic chemistry. Demonstration of copic methods. and understanding of essential treatment of organometallic copic methods. It reatment of organometallic copic most familiar situations and teconclusions relating to the elerately effective advanced laterately effective advanced principles to most familiar situations and catalysis. Show go to the advanced principles to most familiar situations and teconclusions relating to the advanced principles to most familiar situations and teconclusions relating to the atrially effective advanced laterately effective advanced lat	ng ability to analy sightful conclusic ate highly effect air- and moistu pts, principles, a sially those related sition metal clus lence to apply a lic chemistry. Sho draw appropriamonstrate effect air- and moistu air and moistu air and moistu air and moistu show evidence as and concepts mostly correct t advanced principal shoratory skills a mpounds and the concepts, principle try, especially the evidence of limit is and concepts d mostly correct t advanced principal and the concepts of mostly correct the advanced principal and concepts of mostly correct the advanced principal and concepts of mostly correct the advanced principal and concepts of mostly correct the advanced principal boratory skills a				

Course Type	Lecture with laboratory component course					
Course Teaching & Learning Activities	Activities		Details	No. of Hours		
& Learning Activities	Lectures			24		
	Laboratory			30		
	Tutorials			5		
	Reading / Self study			100		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments	(continuous assessment)	30	CLO 1,2,3,4		
	Examination		70 CLO 1,2,3,4			
Required/recommended reading and online materials		R. H. Crabtree: The Organometallic Chemistry of the Transition Metals (Wiley, 2005, 4th ed.) C. Elschenbroich and A. Salzer: Organometallics - A Concise Introduction (VCH, 1992, 2nd revised edition)				
Additional Course Information		eference to specialist texts and other published materials will be made throughout the course. aboratory classes are mandatory. Students must complete ALL experiments and laboratory reports t ass this course.				

CHEM4441 Advanced orga	anic chemi	stry (6 credits)		Academic Year	2015			
Offering Department	Chemistry			Quota	80			
Course Co-ordinator	Prof D Ya	Prof D Yang, Chemistry (yangdan@hku.hk)						
Teachers Involved		Prof D Yang, Chemistry Dr X C Li, Chemistry						
Course Objectives		To provide students with knowledge in organic chemistry reaction mechanisms and organic compound structure determination.						
Course Contents & Topics	investigat	The course covers chemical bonding, advanced stereochemistry, conformational analysis, techniques finvestigating reaction mechanisms, reactive intermediates, rearrangement reactions, and pericycreactions.						
Course Learning Outcomes	On succe	ssful completion of this course, students should	d be able to:					
	CLO 1 c	lescribe, analyze and interpret the structure an	d reactivity re	lationship of organic	molecules			
		dentify and predict the selectivities (chemose organic reactions	electivity, regi	oselectivity and ster	reoselectivity) in			
	CLO 3	lescribe the general approaches to study organ	nic mechanisn	ns				
		CLO 4 have a general understanding and working knowledge of pericyclic reactions, reactive intermediates (radicals, carbenes and nitrenes), and polar rearrangements						
	CLO 5	CLO 5 suggest reasonable mechanistic pathways for some types of organic reactions						
	CLO 6	CLO 6 apply the knowledge of reaction mechanisms in design of synthetic routes for organic compounds						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in C	Pass in CHEM3441 Organic chemistry II						
Offer in 2015 - 2016	Y 1st	sem		Examination	Dec			
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F	A+ to F						
	7							
	A	Demonstrate thorough mastery at an advanced level course learning outcomes. Show strong analytical and thought, and ability to apply knowledge to a wide range	d critical abilities	and logical thinking, with	evidence of original			
Grade Descriptors		course learning outcomes. Show strong analytical and	d critical abilities e of complex, fam f knowledge and	and logical thinking, with iliar and unfamiliar situation skills required for attaining	evidence of original ons. g at least most of the			
	A	course learning outcomes. Show strong analytical and thought, and ability to apply knowledge to a wide range of Demonstrate substantial command of a broad range of course learning outcomes. Show evidence of analytic	d critical abilities e of complex, fam f knowledge and al and critical ab nowledge and sk	and logical thinking, with illiar and unfamiliar situation skills required for attaining illities and logical thinking, ills required for attaining	evidence of original ons. g at least most of the and ability to apply most of the course			
	В	course learning outcomes. Show strong analytical and thought, and ability to apply knowledge to a wide range or course learning outcomes. Show evidence of analytic knowledge to familiar and some unfamiliar situations. Demonstrate general but incomplete command of kr learning outcomes. Show evidence of some analytical commands of the learning outcomes. Show evidence of some analytical courses.	d critical abilities e of complex, fam f knowledge and al and critical ab nowledge and sk al and critical ability ge and skills required.	and logical thinking, with illiar and unfamiliar situatic skills required for attaining illities and logical thinking, ills required for attaining lities and logical thinking, irred for attaining some of	evidence of original ons. g at least most of the and ability to apply most of the course and ability to apply the course learning			
	A B C	course learning outcomes. Show strong analytical and thought, and ability to apply knowledge to a wide range or course learning outcomes. Show evidence of analytic knowledge to familiar and some unfamiliar situations. Demonstrate general but incomplete command of knowledge to most familiar situations. Demonstrate partial but limited command of knowledge to most familiar situations.	d critical abilities as of complex, fam f knowledge and al and critical ab nowledge and skal and critical ability and skills requal thinking, but wowledge and skills requal thinking, but wowledge and skills and critical ability and skills requal thinking, but wowledge and skills regulated thinking and skills requal thinking, but wowledge and skills requal thinking and s	and Togical thinking, with illiar and unfamiliar situation is skills required for attaining ilities and logical thinking, ills required for attaining lities and logical thinking, ilred for attaining some of the limited analytical and could be required for attaining illis required for attaining	evidence of original ons. g at least most of the and ability to apply most of the course and ability to apply the course learning ritical abilities. Show			
Grade Descriptors	A B C D Fail	course learning outcomes. Show strong analytical and thought, and ability to apply knowledge to a wide range of course learning outcomes. Show evidence of analytic knowledge to familiar and some unfamiliar situations. Demonstrate general but incomplete command of knowledge to most familiar situations. Demonstrate partial but limited command of knowledge to most familiar situations. Demonstrate partial but limited command of knowledgoutcomes. Show evidence of some coherent and logic limited ability to apply knowledge to solve problems. Demonstrate little or no evidence of command of knowledgoutcomes. Lack of analytical and critical abilities, logic	d critical abilities as of complex, fam f knowledge and al and critical ab nowledge and skal and critical ability and skills requal thinking, but wowledge and skills requal thinking, but wowledge and skills and critical ability and skills requal thinking, but wowledge and skills regulated thinking and skills requal thinking, but wowledge and skills requal thinking and s	and Togical thinking, with illiar and unfamiliar situation is skills required for attaining ilities and logical thinking, ills required for attaining lities and logical thinking, ilred for attaining some of the limited analytical and could be required for attaining illis required for attaining	evidence of original ons. g at least most of the and ability to apply most of the course and ability to apply the course learning ritical abilities. Show			
Grade Descriptors Course Type Course Teaching	A B C D Fail	course learning outcomes. Show strong analytical and thought, and ability to apply knowledge to a wide range of course learning outcomes. Show evidence of analytic knowledge to familiar and some unfamiliar situations. Demonstrate general but incomplete command of knowledge to most familiar situations. Demonstrate partial but limited command of knowledge to most familiar situations. Demonstrate partial but limited command of knowledgoutcomes. Show evidence of some coherent and logic limited ability to apply knowledge to solve problems. Demonstrate little or no evidence of command of knowledge to solve problems.	d critical abilities as of complex, fam f knowledge and all and critical ab nowledge and skill and critical ability and skills requal thinking, but whowledge and skills requal thinking, but whowledge and skill and coherent	and Togical thinking, with illiar and unfamiliar situation is skills required for attaining ilities and logical thinking, ills required for attaining lities and logical thinking, ilred for attaining some of the limited analytical and could be required for attaining illis required for attaining	evidence of original ons. g at least most of the and ability to apply most of the course and ability to apply the course learning ritical abilities. Show			
Grade Descriptors Course Type Course Teaching	A B C D Fail	course learning outcomes. Show strong analytical and thought, and ability to apply knowledge to a wide range of course learning outcomes. Show evidence of analytic knowledge to familiar and some unfamiliar situations. Demonstrate general but incomplete command of knowledge to most familiar situations. Demonstrate partial but limited command of knowledge outcomes. Show evidence of some analytics knowledge to most familiar situations. Demonstrate partial but limited command of knowledge outcomes. Show evidence of some coherent and logic limited ability to apply knowledge to solve problems. Demonstrate little or no evidence of command of knowledge to solve problems. Ack of analytical and critical abilities, logic knowledge to solve problems.	d critical abilities as of complex, fam f knowledge and all and critical ab nowledge and skill and critical ability and skills requal thinking, but whowledge and skills requal thinking, but whowledge and skill and coherent	and Togical thinking, with illiar and unfamiliar situation is skills required for attaining ilities and logical thinking, ills required for attaining lities and logical thinking, ilred for attaining some of the limited analytical and could be required for attaining illis required for attaining	evidence of original ons. g at least most of the and ability to apply most of the course and ability to apply the course learning ritical abilities. Show the course learning or no ability to apply			
	A B C D Fail Lecture-b	course learning outcomes. Show strong analytical and thought, and ability to apply knowledge to a wide range of course learning outcomes. Show evidence of analytic knowledge to familiar and some unfamiliar situations. Demonstrate general but incomplete command of knowledge to most familiar situations. Demonstrate partial but limited command of knowledge to most familiar situations. Demonstrate partial but limited command of knowledge outcomes. Show evidence of some coherent and logic limited ability to apply knowledge to solve problems. Demonstrate little or no evidence of command of knowledge to solve problems. ased course	d critical abilities as of complex, fam f knowledge and all and critical ab nowledge and skill and critical ability and skills requal thinking, but whowledge and skills requal thinking, but whowledge and skill and coherent	and Togical thinking, with illiar and unfamiliar situation is skills required for attaining ilities and logical thinking, ills required for attaining lities and logical thinking, ilred for attaining some of the limited analytical and could be required for attaining illis required for attaining	evidence of original ons. g at least most of the and ability to apply most of the course and ability to apply the course learning ritical abilities. Show the course learning or no ability to apply			

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	Springer, 2007. J. McMurry, "Org	R.J. Sunberg, "Advanced Organic Canic Chemistry", 8th Ed., Thomson yclic Reactions", Oxford University	Brooks/Cole, 2012.	re and Mechanism", 5th Ed.:

CHEM4443 Integrated orga	ilic Sylitii	esis (o credits)	Academic Ye	ar 2015				
Offering Department	Chemistr	у	Quota	50				
Course Co-ordinator	Prof P Ch	niu, Chemistry (pchiu@hku.hk)						
Teachers Involved	Prof P Ch	niu, Chemistry						
Course Objectives	natural p provide t	To introduce aspects of modern organic reactions with relevance to and in the context of the synthesis of the atural products, drugs and medicinal chemistry to provide an integrated approach to the subject, and to provide training in advanced organic laboratory skills, and further hands-on experience in synthesis and sharacterization, as preparation for graduate studies or research in organic chemistry.						
Course Contents & Topics	course w based or presented the react limitations enantiose	Building on the organic chemistry covered in the foundational courses CHEM1003 and CHEM2402, the course will present modern synthetic methods and synthetic planning. The course is organized into unbased on target drug molecules. In each unit, the chemical biology of these compounds are bried presented and the syntheses of these molecules are introduced, accompanied by in-depth discussions the reactions involved with emphasis on their mechanisms, selectivity, stereochemistry, scope and imitations. Concept of synthetic design including retrosynthetic analysis, stereoselectivity are renantioselective control elements will be emphasized. A laboratory section provides training in the practical skills of synthesis.						
Course Learning Outcomes	On succe	essful completion of this course, student	s should be able to:					
		understand the rationale, selectivities, organic chemistry	and mechanisms of various reaction	ns and reagents in				
	CLO 2	CLO 2 able to solve mechanistic and synthetic chemistry problems						
		CLO 3 perform organic synthesis experiments at an increased level of technical difficulty, use additional skills in experimental design and execution, spectroscopic analysis, and reporting results						
	CLO 4 integrate lecture material and literature search, to learn chemistry independently							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	Pass in CHEM3441 Organic chemistry II (with lab component); or Pass in CHEM3441 Organic chemistry II (without lab component) and CHEM3443 Organic chemis laboratory						
Offer in 2015 - 2016	Y 2n	May						
Offer in 2016 - 2017	Υ			,				
Course Grade	A+ to F							
Grade Descriptors	A	reactions and mechanisms related to synthe theory, and a strong ability to analyze novel	n advanced level of knowledge and understanding of concepts, principles withetic organic chemistry. Show a strong ability to integrate knowledge and ovel synthetic organic chemistry situations and problems. Show a critical use olution of novel and complex synthetic problems. Demonstrate highly effective and techniques in synthetic experiments.					
	В	mechanisms related to synthetic organic che evidence of ability to analyze synthetic organ	I of knowledge and understanding of concepts, principles, reactions an iic chemistry. Show evidence of ability to integrate knowledge and theory, an organic chemistry situations and problems. Show a correct use of knowledge some novel and most familiar synthetic problems. Demonstrate effectives and techniques in synthetic experiments.					
	С	and mechanisms related to synthetic organi theory, and evidence of some ability to analy	nand of knowledge and understanding of conce c chemistry. Show evidence of some ability to rze synthetic organic chemistry situations and p most familiar problems. Demonstrate moderat synthetic experiments.	integrate knowledge and problems. Show a correct				
	D	mechanisms related to synthetic organic ch theory, and a limited ability to analyze fami	nmand of knowledge and understanding of concepts, principles, reactions al anic chemistry. Show evidence of a limited ability to integrate knowledge at the familiar situations and problems. Show some correct but erroneous use of most familiar problems. Demonstrate partially effective organization at is in synthetic experiments.					
	Fail	mechanisms related to synthetic organic che theory in synthetic organic chemistry, and lit mostly erroneous use of knowledge to appl	Demonstrate little or no evidence of command of knowledge and understanding of concepts, principles, reactions and mechanisms related to synthetic organic chemistry. Show little or no evidence of ability to integrate knowledge and theory in synthetic organic chemistry, and little or no ability to analyze most familiar situations and problems. Show mostly erroneous use of knowledge to apply to the solution of familiar problems. Demonstrate minimally effective organization and application of lab skills and techniques in synthetic experiments.					
Course Type	Lecture v	vith laboratory component course						
Course Teaching	Activitie	9S	Details	No. of Hours				
& Learning Activities	Lectures		,	24				
	Laborato			25				
	J. 3.	•						

Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examination		65	CLO 1,2		
	Laboratory reports		25	CLO 1,2		
	Test		10	CLO 3,4		
Required/recommended reading and online materials		Reference Books: Organic synthesis, C. Willis, M. Wills, Oxford Science Publications Top drugs, top synthetic routes, J. Saunders, Oxford Science Publications				
Additional Course Information	Laboratory classes a pass this course.	Laboratory classes are mandatory. Students must complete ALL experiments and laboratory reports pass this course.				

CHEM4444 Chemical biolo	gy (6 cred	dits)				Academic Yea	2015		
Offering Department	Chemistr	у				Quota	50		
Course Co-ordinator	Dr X C L	i, Chemis	stry (xuechenl@hku.hk)						
Teachers Involved	Dr X C L	i, Chemis	stry						
Course Objectives	and gene	To understand how to use chemical approaches to emulate biological systems to study natural molecule and generate new functional molecules. Useful as an introduction to research in areas of chemical biology medicinal chemistry and biotechnology.							
Course Contents & Topics			of nucleic acids, protein cl cal glycobiology and tools a				ations, carbohydra		
Course Learning Outcomes	On succe	essful co	mpletion of this course, stud	dents sh	nould be able to:				
	CLO 1 understand chemical biology approaches in studying biology								
			amples of how to use che cules wiht altered functions	emical	methods to produc	ce natural bion	nolecules and nev		
	CLO 3	compare	chemical biology and tradit	ional bi	iology approaches i	n drug discover	/		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in (CHEM34	41 Organic chemistry II or E	IOC36	01 Metabolism				
Offer in 2015 - 2016	Y 2n	d sem				Examination	May		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all th course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of origina thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills. Insightful use and critical analysis / evaluation of information draw from a full range of high quality sources and to quote/reference aptly.								
	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. Critical use of relevant information from sources, showing 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 appl 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	outcor	nstrate little or no evidence of comes. Lack of analytical and critical edge to solve problems. Organizat ondary sources and no critical com	abilities, ion and p	logical and coherent thi presentational skills are m	nking. Show very li	tle or no ability to apply		
Course Type	Lecture-l	pased co	urse						
Course Teaching	Activitie	es		D	Details No. of				
& Learning Activities	Lectures	3					36		
	Tutorials	5		tu	utorials/discussion		12		
	Reading	/ Self st	udy				100		
Assessment Methods and Weighting	Method	s	Details		Weighting in fi		essment Methods to CLO Mapping		
and weighting	Examina	ation				60 (CLO 1,2,3		

Required/recommended reading and online materials	
Course Website	Nil
Additional Course Information	Nil

CHEM4541 Physical chemis credits)	stry III: st	atistica	al thermodynamics and kin	etics theory (6	Academic	Year	2015		
Offering Department	Chemistr	у			Quota		40		
Course Co-ordinator	Dr H Hu,	Dr H Hu, Chemistry (haohu@hku.hk)							
Teachers Involved	Dr H Hu,	Chemist	ry						
Course Objectives	The course presents fundamental principles and topics on statistical thermodynamics and kinetic theory in order to provide a solid foundation for students intending to further their studies in physical chemistry and related fields.								
Course Contents & Topics	Principles of Statistical Thermodynamics - Thermodynamic laws - Ensembles and partition functions: microcanonical, canonical and grand-canonical - Systems of independent molecules: ideal gas - Molecular degrees of freedom: translation, rotation, vibration, and electronic - Ideal 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 succe	essful co	mpletion 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								
			<u> </u>	'			•		
		CLO 3 understand correlation between macroscopic observables and microscopic statistical model systems							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in CHEM3541 Physical chemistry: introduction to quantum chemistry/Physical chemistry II: introduction to quantum chemistry								
Offer in 2015 - 2016	N	N Examination							
Offer in 2016 - 2017	N								
Course Grade	A+ to F								
Grade Descriptors	A Thorough mastery at an advanced level of extensive knowledge of statistical thermodynamics and reaction dynamic Demonstrate evidence of strong analytical / critical abilities and logical thinking. Can apply the knowledge to practic questions in Physical Chemistry.								
				istical thermodynamics and reaction dynamics. Demonstrate evidence of king. Understand the scope of Physical Chemistry questions that can be					
	C General but incomplete command of knowledge of statistical thermodynamics and reaction dynamics. De evidence of analytical thinking. Can apply the knowledge to familiar situations.					amics. Demonstrate			
	D			of knowledge of statistical thermodynamics and reaction dynamics. inking. Understand the question to be solved with knowledge.					
	Demonstrate limited evidence of analytical thinking. Understand the question to be solved with knowledge. Fail Little or no evidence of command of knowledge of statistical thermodynamics and reaction dynamics.								
Course Type	Lecture	vith Jahor	ratory component course						
Course Teaching	Lecture with laboratory component course					NI= = # 11=			
& Learning Activities	Activities			Details No. of Ho			No. of Hours		
	Lectures						24		
	Laborate	•					24		
	Tutorials						6		
	Reading / Self study			10			100		
Assessment Methods and Weighting	Methods		Details	Weighting in course grad			sment Methods o CLO Mapping		
	Assignments		continuous assessment of class quizzes & assignments	on	40	CLO 1,2,3			
	Examination 60 CLO 1,2,3					1,2,3			
Required/recommended reading and online materials		T. L. Hill, An introduction to Statistical Thermodynamics P. Atkins, Physical Chemistry							
Additional Course Information	Laborato pass this		es are mandatory. Students mu	st complete ALL e	xperiments a	and labo	pratory reports to		

CHEM4542 Computational of	nemistry	(o cre	aits)		Academic Yea	u	2015		
Offering Department	Chemistry	′			Quota	60			
Course Co-ordinator	Prof G H Chen, Chemistry (ghc@yangtze.hku.hk)								
Teachers Involved	Prof G H Chen, Chemistry Dr H Hu, Chemistry								
Course Objectives	This course covers topics in computational chemistry including first-principles methods and molecula dynamics methods. It is offered to undergraduate and postgraduate students interested in computational chemistry, computational physics and computational biology.								
Course Contents & Topics		Hartree-Fock molecular orbital method, density-functional theory, time-dependent methods, Basis set Force Fields, QM/MM method, free energy calculation, and computer-aided drug design.							
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 understand the basic concepts of density-functional theory								
		CLO 2 understand the basic numerical techniques of molecular mechanics method and quantum mechanics/molecular mechanics method							
			the existing computational soft nolecular systems include organ						
Pre-requisites (and Co-requisites and Impermissible combinations)			851 Quantum mechanics or Cal chemistry II: introduction to qu	,	chemistry: intro	ductio	n to quantui		
Offer in 2015 - 2016	N	N Examination							
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A Mastery of advanced 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. Strong analytical and critical abilities and logical thinking, with strong ability to apply knowledge to practical problems in physical chemistry.								
	B Substantial command of a broad range 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 analytical and critical abilities and logical thinking, with ability to apply knowledge to practical problems in physical chemistry.								
	C 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.								
	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 Little or no evidence of 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. 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 w	ith labor	ratory component course						
Course Teaching	Activities			Details			No. of Hours		
& Learning Activities	Lectures						24		
	Laborato	ry		lab sessions 6x4 hours of computational laboratory			24		
	Tutorials						6		
	Reading / Self study						100		
Assessment Methods and Weighting	Methods		Details		eighting in final Ass urse grade (%)		sessment Methods to CLO Mapping		
	Assignments		(continuous assessment)		40 CLO 1,2,3		,2,3		
	Examination				60 CLO 1,2,3				
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 Advanced phy	sical chemistry (6 credits)	2015	
Offering Department	Chemistry	Quota	40

Course Co-ordinator	Prof G H	Chen, C	hemistry (ghc@yangtze.hku.hk)				
Teachers Involved	Prof G H Chen, Chemistry Prof D L Phillips, Chemistry							
Course Objectives	This course covers advanced topics in physical chemistry. It is offered for students majoring in physical chemistry and for students who are interested in postgraduate studies.							
Course Contents & Topics	Time-resolved spectroscopy methods, excited states and reactive intermediates, photophysics and photochemical processes, chemical reaction mechanisms, advanced quantum mechanical methods reaction pathways and surface crossings.							
Course Learning Outcomes	On successful completion of this course, students should be able to:							
		CLO 1 understand the basic concepts of quantum chemistry, statistical thermodynamics and molecular dynamics						
			derstand Hartree-Fock method, statistical ensembles, quantum statistics, H-theorem, and					
	reaction dynamics CLO 3 understand the elementary numerical procedures in Hartree-Fock and molecular mechanics methods							
Pre-requisites (and Co-requisites and Impermissible combinations)			3541 Physical chemistry: intr antum chemistry	oduction to quantu	m chemistry	y/Physic	al chemistry II:	
Offer in 2015 - 2016	Y 2n	Y 2nd sem Examination Ma				May		
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A Mastery of advanced knowledge on following topics: variation method in quantum mechanics, Hartree-Fock method, perturbation theory, advanced statistical thermodynamics, reaction dynamics. Strong analytical and critical abilities and logical thinking, with strong ability to apply knowledge to practical problems in physical chemistry.							
	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 o analytical and critical abilities and logical thinking, with ability to apply knowledge to practical problems in physical chemistry.					amics. Evidence of		
	C Command of knowledge on following topics: variation method in quantum mechanics, Hartree-Fock m perturbation theory, advanced statistical thermodynamics, reaction dynamics. Evidence of some analytical and abilities and logical thinking, with ability to apply knowledge to familiar problems in physical chemistry.					nalytical and critical		
	method, perturbation theory, advanced sta			on following topics: variation method in quantum mechanics, Hartree-Fock atistical thermodynamics, reaction dynamics. Evidence of some coherent thinking, with limited ability to apply knowledge to practical problems in				
	Fock method, perturbation theory, advanced			dge on following topics: variation method in quantum mechanics, Hartreed statistical thermodynamics, reaction dynamics. Lack of analytical and ry little or no ability to apply knowledge to practical problems in physical				
Course Type	Lecture-b	ased co	urse					
Course Teaching	Activities			Details			No. of Hours	
& Learning Activities	Lectures	3					36	
	Tutoriolo			tutorials/discussion		1.		
	Tutorials	•		tutorials/discussion			12	
		/ Self stu	udy	tutorials/discussion			12 100	
Assessment Methods and Weighting		/ Self stu	Details	Weighting in course grade				
	Reading	/ Self stu		Weighting in		to	100	
Assessment Methods and Weighting	Reading	/ Self stu s nents	Details	Weighting in	€ (%)	CLC	100 sment Methods o CLO Mapping	
	Methods Assignm Examina P. W. Atk Ira N. Lev R. C. Toli	s nents ation kins: Physicine: Quaman: The	Details	Weighting in course grade 4th ed.)	20	CLC	sment Methods o CLO Mapping 0 1,2,3	
and Weighting Required/recommended reading	Methods Assignm Examina P. W. Atk Ira N. Lev R. C. Toli	s nents ation kins: Physicine: Quaman: The	Details (continuous assessment) sical Chemistry antum Chemistry (Prentice Hall, e Principles of Statistical Mecha	Weighting in course grade 4th ed.)	20	CLC	ment Methods o CLO Mapping 0 1,2,3	

CHEM4910 Chemistry liter	EM4910 Chemistry literacy and research (6 credits)						
Offering Department	Chemistry	Quota					
Course Co-ordinator	Dr X Li, Chemistry (xiangli@hku.hk)						
Teachers Involved	Various teachers in the Department, Chemistry						
Course Objectives	This course is designed for final year students who would like to gain experience on research methods and techniques by working on small projects on literature research and chemistry research.						
Course Contents & Topics	The course provides training on chemistry literature research techniques. Students will work on a small project on literature research and a short laboratory-based research project. Thelaboratory-based projects are provided by the students' supervisorswho are assigned by the department.						
Course Learning Outcomes							

	On success	sful com	npletion of this course, students	shoul	d be able to:			
	CLO 1 de	monstr	ate knowledge of academic da	tabase	s and search engines	of chemistry	y literature	
	CLO 2 un	derstan	nd the terminology and nomeno	lature	associated with their o	wn researc	h project	
	CLO 3 demonstrate knowledge and understanding of the chemical techniques they used to do the research in their own research project							
			ate knowledge and understanthe broader research area	ding of	f the results of their o	wn researd	ch project and its	
Pre-requisites (and Co-requisites and Impermissible combinations)	CHEM4XX instrumenta CHEM3541 quantum ch This capsto	X) in ation; a Physical Physic	4 credits of advanced level dis the Chemistry Major incluind CHEM3341 Inorganic ch cal chemistry: introduction to rse is for Chemistry Major stud student is allowed to take this	uding emistry quantu ents or	CHEM3241 Analytic II; and CHEM3441 III and CHEM3441 III chemistry/Physical III.	al chemis Organic chemistry	try II: chemical chemistry II; and	
Offer in 2015 - 2016	Y 2nd	sem			Examir	ation	No Exam	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	Show an extensive comprehension of the research project. Demonstrate very able analytical and critical thought with presence of some originality. Illuminating utilization and critical analysis / evaluation of information acquired from a wide range of high quality sources. Critical employment of data and results to synthesize appropriate and illuminating conclusions. Demonstrate integration of a wide range of appropriate theories, principles, data and methods. Employ very effective organizational and presentational skills. [Work of A+ should demonstrate substantial additional work beyond that is required in wider areas relevant to the topic.]						
	В	B Show a substantial comprehension of the research project. Demonstrate able analytical and critical thinking with u of relevant information from sources. Demonstrate ability to compose meaningful comparisons between differe secondary interpretations. Correct utilization of data and results to form appropriate conclusions. Compose generation of theories, principles, data and methods. Perform effective organizational and presentational skills.						
	С	C Show a general but incomplete comprehension of the research project. Presence of some analytical and thinking with use of relevant information from sources. Demonstrate ability to compose comparisons be different interpretations. Mainly correct but some incorrect utilization of data and results to form approximately conclusions. Demonstrate some partial integration of theories, principles, data and methods. Perform more effective organizational and presentational skills.						
	D Show a partial but limited comprehension, with knowledge of some relevant information, of the research presence of some coherent and logical thinking, but with limited analytical and critical abilities. Show utilization reference of several sources, but mostly via summary instead of by analysis and comparison. Limited absemploy data and results to form appropriate conclusions. Demonstrate limited integration of theories, principles and methods. Perform limited or marginally effective organizational and presentational skills.						Show utilization and on. Limited ability to	
	Fail	logical Incorrec	ttle or no comprehension of the resea and coherent thinking. Limited emp ctly utilize data and results and/or una ies, principles, data and methods. Org	loyment ble to fo	of secondary sources and rm appropriate conclusions.	l no critical o Demonstrate	comparison of them.	
Course Type	Laboratory	and wo	rkshop course					
Course Teaching	Activities			Deta	ils		No. of Hours	
& Learning Activities	Laboratory	/					50	
	Tutorials						6	
	Reading /	Self stu	dy				100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		ssment Methods to CLO Mapping	
	Presentati	on	oral presentation		50	CL	O 1,2,3,4	
	Project rep	orts	research report		50	CL	0 1,2,3,4	
Required/recommended reading and online materials	Reading ma	aterials	will be assigned depending on	the pr	oject.			

CHEM4911 Capstone expe	erience for chemistry undergraduates: HKUtopia (6 credits)	Academic Year	2015			
Offering Department	Chemistry Quota					
Course Co-ordinator	Dr A P L Tong, Chemistry (apltong@hku.hk)					
Teachers Involved	Various teachers in the Department, Chemistry					
Course Objectives	This project-based course with the theme of Chemistry for a Better L provide students with a capstone experience. It aims to enable students world is facing with that have to be solved by chemistry and relate apply what they have learnt in classroom and conduct literature so research and related technology under development to solve the provarious channels.	ents to think what a ted technology. Stu earch regarding ad	re the key issues dents will need to vanced chemistry			
Course Contents & Topics	No formal teaching. It is expected that students are actively engaged working on this project. Students will work in groups of two or three, under the supervision of					

	of the pro (May - Au		two to three months. The ti	me of r	unning this project	t-based o	course is in the summer		
Course Learning Outcomes	On succe	essful comple	etion of this course, students	should	be able to:				
			d evaluate the various issumed to solve the problem.		are facing with	and dete	ermine ways in which		
	CLO 2	integrate the	eory and practice, and to und	lerstand	l limitations of their	r 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 furtl	ner logical, critical thinking a	nd creat	tivity				
		•	others the appreciation for c		•	ce to our	daily life		
Pre-requisites (and Co-requisites and Impermissible combinations)	and at le Major. Students April - Ma This caps	who are intage. Late applestone course	ed to have satisfactorily com dits of advanced level disciplerested in taking the course dication may not be considered is for Chemistry Major stud- dudent is allowed to take this	plinary e should ed. ents onl	core/elective cher d contact the cour y.	mistry co	urses in the Chemistry		
Offer in 2015 - 2016	Y Su	ımmer			Exa	mination	n No Exam		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	evidence of high quality conclusion highly effe	te thorough grasp of the subject. of original thought. Insightful use any sources and to quote/reference as. Show integration of the full rang ctive organizational and presenta to its required in wider areas relevan	d critical aptly. Criti ge of app tional ski	analysis / evaluation o cal use of data and re ropriate theories, prind lls. [Work of A+ shou	f information sults to dra ciples, evid	on drawn from a full range of aw appropriate and insightful ence and techniques. Apply		
	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.								
	С	thinking. Uniterpretati appropriate	te general but incomplete grasp of Jse of relevant information from ons and to quote/reference aptly. e conclusions. Show some partia effective organizational and presein	sources Mostly c I integrati	, showing ability to orrect but some erron on of theories, princi	make com eous use	parisons between different of data and results to draw		
	D	coherent a several so results to	ate partial but limited grasp, with re and logical thinking, but with limite urces, but mainly through summar draw appropriate conclusions. Sho ad or barely effective organizational	ed analyti y rather tl w limited	cal and critical abilitien than analysis and composite integration of theories	es. Demons parison. Lir	nstrate use and reference of imited ability to use data and		
	Fail	lack of ana comparison inapt integr	te evidence of little or no grasp of alytical and critical abilities, logical a n of them. Misuse of data and resu ration of theories, principles, eviden i neffective.	and coher ults and/o	ent thinking. Limited up r unable to draw appro	se of secor	ndary sources and no critical clusions. Show little or no or		
Course Type	Project-b	ased course							
Course Teaching	Activitie	es		Detail	s		No. of Hours		
& Learning Activities	Meeting	with superv	isor	Tutoria	als		10		
		/ Self study					60		
	Assessr			Group	work or project		70		
Assessment Methods and Weighting	Method	s	Details		Weighting in fi		Assessment Methods to CLO Mapping		
	Oral pre	sentation			<u> </u>	50	CLO 1,2,3,4,5,6		
	·	h report				50	CLO 1,2,4,5,6		
Required/recommended reading and online materials			xtbooks and references. Str y, e-journals, internet, and di						
Course Website	http://ww	w.chemistry	.hku.hk/hkutopia/						
Additional Course Information	Enrolmer	nt of this co	urse is not conducted via t t Department/School office						

CHEM4966 Chemistry in	Academic Year	2015	
Offering Department	Chemistry	Quota	
Course Co-ordinator	Dr H Y Au-Yeung, Chemistry (hoyuay@hku.hk)		
Teachers Involved	Dr H Y Au-Yeung, Chemistry		
Course Objectives			

	major of s	tudy. The gained	o offer students the opportunitie e workplace learning experience in the study to the real work env ner within the University or outsion	e wo	ould be of great ben ments. Students ha	efits to the ve to take o	students to apply their in at least 160 hours of
Course Contents & Topics	or various - Outside student w member o	tasks as the Univ ill be sup of the Dep vill norma	sity: The student will be supervi- instructed by the Supervisor. rersity: The student will work in ervised under a staff member of partment/School of the student (stally be instructed by the External	n an f the the l	external agency re external agency (th nternal Supervisor).	lated to the e External : The work	e major of study. The Supervisor) and a staff to be performed by the
Course Learning Outcomes	On succe	ssful com	pletion of this course, students s	shou	ld be able to:		
	CLO 1	apply kno	owledge in their major study in s	olvir	ng practical problems	s in the wor	k place
	CLO 2	gain first	hand work experience in the inc	dustr	y related to their ma	jor study	
Pre-requisites (and Co-requisites and Impermissible combinations)	CHEM4X This caps	XX) in the tone cour	4 credits of advanced level disc chemistry Major. se is for Chemistry Major studer student is allowed to take this ca	nts o	nly.	·	·
Offer in 2015 - 2016	Y 2nd	Y 2nd sem Summer Examination					No Exam
Offer in 2016 - 2017	Υ						
Course Grade	Pass/Fail						
Grade Descriptors	Pass	the job colleagu working	apply knowledge to solve problems in the or assigned by supervisor(s). Estables, and clients in the job. Successfully hours, written and oral report, and ance in the above would be awarded a g	lishes y fulfil evalu	effective collaboration lls the requirements set uation by supervisor(s),	and commun	ication with supervisor(s), urse Description regarding
	Fail	assigne colleagu	ited or no ability to solve problems in th d by supervisor(s). Fails to establish es, or clients in the job. Fails to satisfy rritten and oral report, or evaluation by s	effe	ctive collaboration or crequirements set out in the	ommunication	with supervisor(s), other
Course Type	Internship						
Course Teaching & Learning Activities	Activitie	S		De	tails		No. of Hours
a Learning Activities	Internshi	o work		wo	s expected that stud ork at least 160 ho uivalent of 4 weeks	urs (or the	
Assessment Methods and Weighting	Methods	1	Details		Weighting in fina course grade (%		ssessment Methods to CLO Mapping
	Written re	eport	written report, employ feedback and oral presentation		10	0	CLO 1,2
Additional Course Information	internship Students Enrolmen	will be r who are in t of this	etion of this course can be ecorded on the student's trans nterested to enrol in this course course is not conducted via the Department/School office after	cript shou ne o	. This course will build contact the Depa nline course selecti	e assessed rtment to ol on system	I on "Pass/Fail" basis. otain the approval. and should be made

CHEM4999 Chemistry proj	ect (12 c	redits)	Academic Year	2015			
Offering Department	Chemis	Chemistry Quota					
Course Co-ordinator	Dr J Y T	ang, Chemistry (jinyao@hku.hk)	'	·			
Teachers Involved	Various	teachers in the Department, Chemistry					
Course Objectives		de experience of research techniques by working on er of staff. This course would prepare students for gr					
Course Contents & Topics	A short	research project provided by a member of staff (e.g. the	he students supervisor).				
Course Learning Outcomes	On succ	essful completion of this course, students should be a	able to:				
	CLO 1 understand the terminology and nomenclature associated with their own research chemistry 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 knowledge and understanding of the recontext in the broader research area	results of their own chemist	ry project and its			
Pre-requisites (and Co-requisites and Impermissible combinations)	CHEM4 instrum CHEM3 quantur This cap	at least 24 credits of advanced level disciplinary con XXX) in the Chemistry Major including CHEI entation, and CHEM3341 Inorganic chemistry II, 541 Physical chemistry: introduction to quantum chan chemistry. Instone course is for Chemistry Major students only. iest that a student is allowed to take this capstone co	M3241 Analytical chemist and CHEM3441 Organic nemistry/Physical chemistry	try II: chemistry chemistry II, and			

Offer in 2015 - 2016	Y Year I	long	1	Examination	No Exam			
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F	A+ to F						
Grade Descriptors	A	Show an extensive comprehension of the res presence of some originality. Illuminating util wide range of high quality sources. Critical en conclusions. Demonstrate integration of a wire very effective organizational and presentatio beyond that is required in wider areas relevan	ization and critical analysis aployment of data and result de range of appropriate theo al skills. [Work of A+ shou	/ evaluation of inform ts to synthesize appropries, principles, data	nation acquired from a priate and illuminating and methods. Employ			
	В	Show a substantial comprehension of the res of relevant information from sources. Demo secondary interpretations. Correct utilization integration of theories, principles, data and me	nstrate ability to compose of data and results to form	meaningful comparis appropriate conclusion	ons between different ons. Compose general			
	С	Show a general but incomplete comprehens thinking with use of relevant information fr different interpretations. Mainly correct but conclusions. Demonstrate some partial integeffective organizational and presentational ski	om sources. Demonstrate some incorrect utilization gration of theories, principle	ability to compose of data and results	comparisons between s to form appropriate			
	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 resea logical and coherent thinking. Limited emp Incorrectly utilize data and results and/or una of theories, principles, data and methods. Org	loyment of secondary sou ble to form appropriate cond	rces and no critical clusions. Demonstrate	comparison of them. e little or no integration			
Course Type	Project-base	ed course						
Course Teaching	Activities		Details		No. of Hours			
& Learning Activities		Reading / Self study 8 hours per week for 24 weeks or longer discussions & meetings						
_	Reading / S	Self study			192			
Assessment Methods and Weighting	Reading / S Methods	Self study Details		meetings nal Asse	192 essment Methods to CLO Mapping			
Assessment Methods		Details	Weighting in fit course grade (meetings nal Asse	ssment Methods			
Assessment Methods	Methods Dissertation	Details including a written report and	Weighting in fit course grade (meetings nal Asse	essment Methods to CLO Mapping			

CSCI9001 Practical Chines			acina (o orcuita)			demic Year	2015		
Offering Department	Chinese				Quo	ta			
Course Co-ordinator	_		inese (kwwongb@hkusua.hku.i	hk)					
Teachers Involved	Dr K T La	C M Chan, Chinese K T Lam, Chinese S F Lee, Chinese K W Wong, Chinese							
Course Objectives	helps the emails, I resentati	e student letters, ar ion and c	to enhance the students' comp is to master the techniques of nouncements, notice, brochur liscussion techniques, the stylents' linguistic sensitivity.	f writing differences, leaflets,	erent types of and reports.	documents : In addition, t	such as opics add	memos dressino	
Course Contents & Topics	message Techniqu	es: good- ues of wr	abulary of modern Chinese - T news and goodwill message iting electronic documents: em and presentations	s, bad-news	s messages,	and persuas	ive mess	säges	
Course Learning Outcomes	On succe	essful cor	npletion of this course, students	should be a	ble to:				
	CLO 1	develop a	a balanced competency in mode	ern Chinese a	and write well-f	ormed senter	nces		
	CLO 2	employ rl	netorical devices and stylistics,	as well as pra	actical writing	skills specific t	cific to their discipline		
		explore challenge	new tactics of communication	n, initiate dis	scussions and	debates an	d addres	s new	
			ir disciplinary knowledge and t es analytically, critically and crea						
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL	NIL							
Offer in 2015 - 2016	Y 1s	st sem 2	nd sem		Exa	mination	Dec	May	
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	A The student acquired a superb ability to achieve the intended learning outcomes of the learning: describe, apply, evaluate, and synthesize the language techniques for effective situations.							
	В		udent acquired the ability to achieve the apply, evaluate, and synthesize the						
	C	learnin	udent acquired adequate ability to ac g (i.e. describe and apply the langua g (i.e. evaluate and synthesize the lang	ge techniques f	for effective comr	nunication) but r			
	D	The stu	udent only has basic familiarity with the	subject.					
	Fail	The stu	udent has very limited familiarity with the	e subject.					
Course Type	Lecture-l	based cou	ırse						
Course Teaching	Activitie	es		Details			No. of	Hours	
& Learning Activities	Lecture	S						12	
	Tutorials	s		Small group tutorials				12	
	Group v	vork		Workshops				24	
	Discuss	sion						24	
	Reading	g / Self stu	udy		elf study (20 ation (12 hours	,		32	
	Assessr	ment						16	
Assessment Methods and Weighting	Method	ls	Details		hting in final se grade (%)		sment Mo o CLO Ma		
	Assignn	nents	Self-access & online exercitation (40%) and Tutorial disscuss (10%)		50				
	Examina	ation			50				
Required/recommended reading and online materials	用》。香 市大學出 商業傳意 市大學語 2001年。	港:香港 版社。 月 大全》。 文學部 ・《企業文	《漢語修辭》。上海:上海大學 大學出版社。 香港城市大學	語文學部・200 寫作教程》。 1998年。《淳 ・香港:香済 長經濟出版社	香港:三聯書 漢語寫作》。上 港城市大學出版 。 劉美森·2	事意:基礎篇) 店。 李錦昌・ 海:上海大學 対社。 201年。《新紹 2001年。《新紹	》。香港: 2000年。 出版社。 文略、蘭德 編公文寫作	:香港城 。《現代 香港城 憲主編,	

EASC1020 Introduction to		-	o oreuroj			cademic Ye	uı	2015
Offering Department	Earth Sci	ences			Q	uota		
Course Co-ordinator	Dr Z H Li	u, Earth S	sciences (zhliu@hku.hk)					
Teachers Involved	Dr Z H Li	u, Earth S , Earth Sc						
Course Objectives	the contro	This course provides an introduction to the study of global climate systems and climate change. We see the controls of temporal and spatial variations in earth's climate and its histories of past climates presed in the geological record. We look at modern research methods that are used in paleoclimatic paleoenvironmental reconstructions.						
Course Contents & Topics	through g	Global climatic systems, climate classification, natural variability of climate, physical causes for through geologic time, external and internal forcing mechanisms, solar orbital variations, man events of the past and their effects on how our planet has developed, glacial and interglacial of predicting future global change.						
Course Learning Outcomes	On succe	On successful completion of this course, students should be able to:						
	CLO 1	identify	major aspects of climate	logy and ap	proaches to climat	ological stud	у	
	CLO 2	explain	the factors and physical	processes	controlling climate s	system		
	CLO 3	understa	and the driving forces of	Earth's clim	nate change	•		
	CLO 4		ze the history of Earth's					
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL		,					
Offer in 2015 - 2016	Y 2nd	d sem			E	xamination		May
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	Domons	strate thorough mastery at an	advanced leve	ol of avtansiva knowled	an and skills ro	quirod fo	or attaining all th
·		course learning outcomes. Show strong critical abilities and logical thinking, with evidence of original thought, a ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Demonstrate critical use 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.						inal thought, an ate critical use o
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least m course learning outcomes. Show evidence of critical abilities and logical thinking, and ability to apply known familiar and some unfamiliar situations. Demonstrate correct use of data and results to draw appropriate cor Show critical use of relevant information from sources and ability to make meaningful comparisons between secondary interpretations and to quote/reference aptly.						ply knowledge to riate 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. 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 les outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. limited ability to apply knowledge to solve problems. Demonstrate limited ability to use data and results to appropriate conclusions. Show use and reference of several sources, but mainly through summary rather analysis and comparison.					cal abilities. Show d results to draw	
	Fail	outcome	strate little or no evidence of es. Lack of analytical and criti dge to solve problems. Der ions. Show limited use of seco	cal abilities, log nonstrate mist	gical and coherent think use of data and resu	king. Show very ults and/or una	little or	no ability to appl
Course Type	Lecture-b	ased cou	rse					
Course Teaching	Activitie	es		Deta	ails			No. of Hours
& Learning Activities	Lectures							36
	Tutorials							1:
	Project v							3(
	-		du				50	
	Reading	/ Self stu	uy					31
Assessment Methods and Weighting	Methods	S	Details		Weighting in fi course grade (nent Method: CLO Mapping
	Assignm	ents				25	CLO	2,3
	Examina	ition				50	CLO 1	,2,3,4
	Project r	eports				25	CLO	1,4
Required/recommended reading and online materials			Earth's Climate Past and d Anthony J. Vega: Clim					

EASC1401 Blue Planet (6 cr	Academic Year	2015		
Offering Department	Offering Department Earth Sciences			
Course Co-ordinator	Dr P Bach, Earth Sciences (pabach @hku.hk)			

	DITET	Dr P Bach, Earth Sciences Dr T P Y Tam, Earth Sciences						
Course Objectives	knowledg dynamic addition,	The aim is to provide those students who are taking a first course in Earth 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. I 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 & Topics	- Introduc - Lithospl Cycle) - Hydrosp - Atmospl - Biosphe - Concep	etion to Earth there (Earth ohere (Surface there (Composite (Life, Eco ots and Evo	uce and discuss the follow Systems and Habitable P Materials, Plate Tectonics ce- and Groundwater, Oce sosition, Weather, Climate, on systems, Evolution and Ex solution of Dynamic Earth al Hazards, Climate Chang	lanet Earth, s, Volcanism, Earth ans and Water Cycle Green House Effect, ttinction, Geochemic Systems, Human	e) Oxygen Cycl al Cycles, Interactions	e) with Plan	et Earth	
Course Learning Outcomes	On succe	ssful comple	etion of this course, studen	ts should be able to:				
		understand Sciences	the terminology and nom	enclature appropria	te to the intr	oductory	study o	f Eartl
			knowledge and understar Systems and their dynamic			associated	d with the	e stud
	CLO 3	understand t	he extent and nature of glo	bal change and env	ironmental co	ncerns ar	ound us	
		demonstrate field environ	the ability to make and rements	cord observations o	n Earth Syste	ems proce	esses in	natura
	CLO 5	develop skills	s to synthesize observation	and knowledge in a	report in ess	ay form		
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL							
Offer in 2015 - 2016	Y 1st	Y 1st sem 2nd sem Examination					Dec	May
Offer in 2016 - 2017	Υ	Υ						
Course Grade	A+ to F							
Grade Descriptors	В	required for terminology between Expresent im impressive Demonstration and concept and concept attaining attain	the thorough mastery of extensive r attaining most or all of the or and concepts and strong abilitie arth Systems. Demonstrates high portant observations made and level of depth and original though the substantial command of knowled most of the course learning outs and some abilities to apply an	course learning outcomes to apply and relate the billy effective observational uses them to draw a tiss. edge / competencies/skill. utcomes. Shows evidence delate them in a range of the standard outcomes.	s. Shows clear em in a range of I skills in field as ppropriate and s at an Earth Sci- e for understand	understandi complex int s well as orga insightful co	ing of intresponding of interestive panizationa onclusions octory level	oductor rocesse I skills t with a require minolog
			Demonstrates effective observati		Il on organizatio	ctive proces	ses betwe	
	С	Demonstratilevel requirements introductory between Eskills to pre	te general but incomplete committee for attaining most of the contemporal properties and concepts and arth Systems. Demonstrates mostly esent observations made mostly	ppropriate and insightful and of knowledge / compourse learning outcomes some abilities to apply aderately effective observances.	conclusions with etencies/skills at . Shows eviden and relate them rational skills in	active processinal skills to some level of the an Earth Sice for some interestination as well	present in	mportai roductor inding or rocesse
	C	Demonstral level required introductory between E skills to preconclusions Demonstrative required for terminology Systems. I	te general but incomplete committee for attaining most of the contemporal properties and concepts and arth Systems. Demonstrates mostly esent observations made mostly	ppropriate and insightful and of knowledge / compurse learning outcomes some abilities to apply derately effective observered but with some of knowledge / competencing outcomes. Shows east oapply and relate the last skills in field. Applies	conclusions with etencies/skills at an Ewidence of limite m in some interact or bare is limited or bare in some interact in limited or bare in some interactions.	active processonal skills to some level of the arth S ce for some in some intifield as well and results to the arth Science of understand understand understandly effective processly effective	ses betwee present i of depth. cience intre- e understa- eractive p I as organ o draw ap e introduct ding of intri- ses betwee organizati	mportal moductor inding of rocesse nizational propriat mory leve oductor en Eart ponal an
		Demonstratievel required introductory between E skills to preconclusions. Demonstrate required for terminology Systems. I presentatio Demonstrate level require terminology Systems. I sy	te general but incomplete committed for attaining most of the content of the cont	ppropriate and insightful and of knowledge / compuse learning outcomes some abilities to apply degrately effective observered but with some of knowledge / competencing outcomes. Shows es to apply and relate the hall skills in field. Applies ails and facts correctly. Liand of knowledge / compig outcomes. Shows little bilities to apply and relate skills in field. Applies and some some some some some some some some	conclusions with etencies/skills at . Shows eviden and relate them rational skills in erroneous use a lies/skills at an Evidence of limite in some interational shills at or no evidence of them in interation etencies/skills at or no evidence of them in interation in the rational shills at or no evidence of them in interation etherent organization.	active processional skills to some level of the an Earth Side for some in some into field as well and results to the arth Science of the arth Scie	ses betwe present i of depth. cience intre e underste eractive p I as organ o draw ap e introduct ding of intresses betwe organizati atte conclucience introduct ding of intresses betwe organizati atte conclucience organizati ses betwe organizati production of intresses betwe opportunity of intresses betwe opportunity of intresses betwe opportunity of depth of the present of the	mportar roductor inding of rocesse hizational propriat cory leve oductor en Eart ponal an sions. oductor oductor oductor oductor oductor en Eart
Course Type	D Fail	Demonstrat level required introductory between E skills to preconclusions. Demonstrat required for terminology Systems. E presentatio Demonstrat level require terminology Systems. E skills. Ineffet	te general but incomplete committed for attaining most of the contract of the	ppropriate and insightful and of knowledge / compuse learning outcomes some abilities to apply degrately effective observered but with some of knowledge / competencing outcomes. Shows es to apply and relate the hall skills in field. Applies ails and facts correctly. Liand of knowledge / compig outcomes. Shows little bilities to apply and relate skills in field. Applies and some some some some some some some some	conclusions with etencies/skills at . Shows eviden and relate them rational skills in erroneous use a lies/skills at an Evidence of limite in some interational shills at or no evidence of them in interation etencies/skills at or no evidence of them in interation in the rational shills at or no evidence of them in interation etherent organization.	active processional skills to some level of the an Earth Side for some in some into field as well and results to the arth Science of the arth Scie	ses betwe present i of depth. cience intre e underste eractive p I as organ o draw ap e introduct ding of intresses betwe organizati atte conclucience introduct ding of intresses betwe organizati atte conclucience organizati ses betwe organizati production of intresses betwe opportunity of intresses betwe opportunity of intresses betwe opportunity of depth of the present of the	mportar roductor roductor rocesse nizationa propriat rory leve oductor en Eart ponal an sions. oductor oductor oductor en Eart
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Course Teaching	D Fail Lecture w	Demonstrat level required introductory between E skills to preconclusions. Demonstrat required for terminology Systems. E presentatio Demonstrat level require terminology Systems. E skills. Ineffectivith laborator	te general but incomplete committed for attaining most of the contract terminology and concepts and arth Systems. Demonstrates most assent observations made mostly is. It is partial but limited command or attaining some of the course lear and concepts and limited abilitie Demonstrates limited observational skills to present observed detailed in the course learning and concepts and little or no attended for attaining the course learning and concepts and little or no attended to the little or no attended to the little or no attended to observed detailed the little or no attended to observed detailed the little or no attended to observed detailed the little or no attended to observe detailed the little or no attended the little or n	ppropriate and insightful and of knowledge / compurse learning outcomes some abilities to apply iderately effective observence or the correct but with some of knowledge / competence or the computation of the computation of knowledge / competence / knowledge / knowl	conclusions with etencies/skills at . Shows eviden and relate them rational skills in erroneous use a lies/skills at an Evidence of limite in some interational shills at or no evidence of them in interation etencies/skills at or no evidence of them in interation in the rational shills at or no evidence of them in interation etherent organization.	active processional skills to some level of the an Earth Side for some in some into field as well and results to the arth Science of the arth Scie	ses betwe present i of depth. cience intre e understa eractive p I as organo draw ap e introduct ding of intresses betwe organizati ate conclucience introduct ding of intresses betwe ses betwe ses between organizations.	mportar oductor oductor oductor or or or or oductor or or oductor or oductor oductor oductor oductor oductor oductor oductor of oductor oductor of oductor of oductor oductor oductor oductor oductor oductor oductor oductor
Course Teaching	D Fail Lecture w Activitie Lectures	Demonstratievel required for terminology Systems. E presentation Demonstratievel required for terminology Systems. E presentation Demonstratievel require terminology Systems. E skills. Ineffectif laborator	te general but incomplete committed for attaining most of the contract terminology and concepts and arth Systems. Demonstrates most assent observations made mostly is. It is partial but limited command or attaining some of the course lear and concepts and limited abilitie Demonstrates limited observational skills to present observed detailed in the course learning and concepts and little or no attended for attaining the course learning and concepts and little or no attended to the little or no attended to the little or no attended to observed detailed the little or no attended to observed detailed the little or no attended to observed detailed the little or no attended to observe detailed the little or no attended the little or n	ppropriate and insightful and of knowledge / compurse learning outcomes some abilities to apply iderately effective observence or the correct but with some of knowledge / competence or the computation of the computation of knowledge / competence / knowledge / knowl	conclusions with etencies/skills at . Shows eviden and relate them rational skills in erroneous use a lies/skills at an Evidence of limite in some interational shills at or no evidence of them in interation etencies/skills at or no evidence of them in interation in the rational shills at or no evidence of them in interation etherent organization.	active processional skills to some level of the an Earth Side for some in some into field as well and results to the arth Science of the arth Scie	ses betwe present i of depth. cience intre e understa eractive p I as organo draw ap e introduct ding of intresses betwe organizati ate conclucience introduct ding of intresses betwe ses betwe ses between organizations.	mporta oducto nding rocesses nization propria ory lev oducto en Ear onal ar soducto oducto en Ear ntation
Course Teaching	D Fail Lecture w Activitie Lectures Laborato Field wo	Demonstratievel required for terminology Systems. E presentation Demonstratievel required for terminology Systems. E presentation Demonstratievel require terminology Systems. E skills. Ineffectif laborator	te general but incomplete committed for attaining most of the contract terminology and concepts and arth Systems. Demonstrates most assent observations made mostly is. It is partial but limited command or attaining some of the course lear and concepts and limited abilitie Demonstrates limited observational skills to present observed detailed in the course learning and concepts and little or no attended for attaining the course learning and concepts and little or no attended to the little or no attended to the little or no attended to observed detailed the little or no attended to observed detailed the little or no attended to observed detailed the little or no attended to observe detailed the little or no attended the little or n	ppropriate and insightful and of knowledge / compurse learning outcomes some abilities to apply iderately effective observer that with some of the control o	conclusions with etencies/skills at . Shows eviden and relate them rational skills in erroneous use a lies/skills at an Evidence of limite in some interational shills at or no evidence of them in interation etencies/skills at or no evidence of them in interation in the rational shills at or no evidence of them in interation etencies/skills at or no evidence of them in interation of the relation of the shills at other entry or an evidence of them in interation of the shills at the shill at the shills at the shill at the shill at the shill at the shill at the shills at the shill a	active processional skills to some level of the an Earth Side for some in some into field as well and results to the arth Science of the arth Scie	ses betwe present i of depth. cience intre e understa eractive p I as organo draw ap e introduct ding of intresses betwe organizati ate conclucience introduct ding of intresses betwe ses betwe ses between organizations.	mporta oducto oducto oducto en Ear sions. oducto en Ear sions. oducto en Ear sions. 1 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	D Fail Lecture w Activitie Lectures Laborato Field wo	Demonstral level require introductory between Eskills to proconclusions Demonstral required for terminology Systems. Expresentation Demonstral level require terminology Systems. Exitles Ineffective terminology Systems. Exitles Ineffective Information Ineffective Information Ineffective Information Ineffective Information Infor	te general but incomplete committed for attaining most of the contract terminology and concepts and arth Systems. Demonstrates most assent observations made mostly is. It is partial but limited command or attaining some of the course lear and concepts and limited abilitie Demonstrates limited observational skills to present observed detailed in the course learning and concepts and little or no attended for attaining the course learning and concepts and little or no attended to the little or no attended to the little or no attended to observed detailed the little or no attended to observed detailed the little or no attended to observed detailed the little or no attended to observe detailed the little or no attended the little or n	ppropriate and insightful and of knowledge / compurse learning outcomes some abilities to apply iderately effective observer or the control of knowledge / competency of knowl	conclusions with eletencies/skills at . Shows eviden and relate them rational skills in erroneous use a lies/skills at an Exidence of limite in some intera is limited or bare mited ability to detencies/skills at or no evidence of eletencies/skills at or no evidence of them in interacherent organize to draw approp	active processional skills to some level of an Earth Scener field as well and results to the school of the skills to the skills	ises betwee present in of depth. cience introduction in the end of the condition of the co	mportal coduction oduction oduction oduction of the coduction of the coduction of the coduction oduction oducti
Course Teaching & Learning Activities Assessment Methods	D Fail Lecture w Activitie Lectures Laborato Field woo Reading	Demonstral level require introductory between E skills to proconclusions. Demonstral required for terminology Systems. It presentation Demonstral level require terminology Systems. E skills. Ineffectivith laboratories.	the general but incomplete committed for attaining most of the content terminology and concepts and arth Systems. Demonstrates mosent observations made mostly is. It partial but limited command of attaining some of the course lear and concepts and limited abilities cand concepts and limited abilities committed to the little or no evidence of committed in a concepts and limited abilities and concepts and limited abilities are done attaining the course learning and concepts and little or no a demonstrates poor observational active presentation of observed dety component course	ppropriate and insightful and of knowledge / compurse learning outcomes some abilities to apply iderately effective observer or the control of knowledge / competency of knowl	conclusions with eletencies/skills at . Shows eviden and relate them rational skills in erroneous use a lies/skills at an Evidence of limite in some intera i limited or bare mited ability to detencies/skills at or no evidence of them in interacoherent organize to draw approp	active processional skills to some level of an Earth Size for some in some introduced in some interest in some introduced in some introduced in some interest	isses between present in of depth. cience introduction in a control of a control o	mporta oducto od
Course Teaching & Learning Activities Assessment Methods	D Fail Lecture w Activitie Lectures Laborato Field woo Reading Methods Examina	Demonstral level require introductory between E skills to proconclusions. Demonstral required for terminology Systems. It presentation Demonstral level require terminology Systems. E skills. Ineffectivith laboratories.	the general but incomplete committed for attaining most of the content terminology and concepts and arth Systems. Demonstrates mosent observations made mostly is. It partial but limited command of attaining some of the course lear and concepts and limited abilities cand concepts and limited abilities committed to the little or no evidence of committed in a concepts and limited abilities and concepts and limited abilities are done attaining the course learning and concepts and little or no a demonstrates poor observational active presentation of observed dety component course	ppropriate and insightful and of knowledge / compurse learning outcomes some abilities to apply iderately effective observer or the control of knowledge / competency of knowl	conclusions with eletencies/skills at . Shows eviden and relate them rational skills in erroneous use a lies/skills at an Evidence of limite m in some intera: limited or bare mited ability to detencies/skills at or no evidence of them in intera coherent organize to draw approp	active processional skills to some level of the an Earth Side for some in some interest of the some in some interest of the some intere	ses betwe present i of depth. cience intre e underste eractive p I as organ o draw ap e introduct ding of intresses between organization at econclucience introduct ding of intresses between organizations. No. of ment M. CLO M. O 1,2,3	mporta oducto od
Course Teaching & Learning Activities Assessment Methods	D Fail Lecture w Activitie Lectures Laborato Field woo Reading Methods Examina	Demonstral level required for terminology Systems. E presentation Demonstral level required for terminology Systems. E presentation Demonstrate level require terminology Systems. E skills. Ineffe vith laborator ses in the system of the syst	the general but incomplete committed for attaining most of the content terminology and concepts and arth Systems. Demonstrates mosent observations made mostly is. It partial but limited command of attaining some of the course lear and concepts and limited abilities cand concepts and limited abilities committed to the little or no evidence of committed in a concepts and limited abilities and concepts and limited abilities are done attaining the course learning and concepts and little or no a demonstrates poor observational active presentation of observed dety component course	ppropriate and insightful and of knowledge / compurse learning outcomes some abilities to apply iderately effective observer or the control of knowledge / competency of knowl	conclusions with vetencies/skills at . Shows eviden and relate them vational skills in erroneous use a lies/skills at an Evidence of limite m in some intera mitted or bare mitted ability to detencies/skills at or no evidence of ethem in intera coherent organizate to draw appropriate to draw appropriate in the detencies/skills at or no evidence of ethem in intera coherent organizate to draw appropriate t	Assess Assess CL CL CL CL CS Conal skills to consone level of the process	isses between present in of depth. cience introduction in a control of a control o	mporta oducto onding rocesse ization ory lev oducto on le ory oducto on Ear sions. oducto oducto ory oducto oducto of the oducto of the oducto

Required/recommended	Skinner B.J and Murck B.W.: The Blue Planet (2011)
reading	Murphy, B and Damian N.: Earth Science Today (1999)
and online materials	

EASC1402 Principles of ge					0			
Offering Department	Earth Sci				Quota			
Course Co-ordinator			iences (minsun@hku.hk)					
Teachers Involved		Prof M Sun, Earth Sciences Dr J A King, Earth Sciences						
Course Objectives	This coul	This course is an introduction to fundamental principles and concepts in geology.						
Course Contents & Topics	- Rocks a - Plate te - Earthqu - Igneous - Geomo - Sedime - Folds, F - Metamo - Principl - Biostrat	- 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	On succe	essful comple	etion of this course, student	ts should l	be able to:			
	CLO 1	recite the ro	ock cycle and the rock mate	rial in the	earth's crust			
	CLO 2		e overall structure of the ea			nal pro	cesses	
	CLO 3		major geological phenome			•		
	CLO 4	describe the	e methods in geological dat	ting		•		
	CLO 5	name the m	najor events in earth's histo	ry				
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL	1						
Offer in 2015 - 2016	Y 1s	t sem			Examinati	on	Dec	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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 cours							
	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 le outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational presentational skills.					critical abilities. Show		
	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 v	vith laborator	ry component course					
Course Teaching	Activitie	es		Details			No. of Hour	
& Learning Activities	Lectures	3		12 sess	sions x 2 hours		24	
	Laborate	ory		laborate mineral identifc			1	
	Field wo	ork		1 field t	rip			
	Group w	ork/		1 group	project with presentation	n		
	Reading	/ Self study					10	
Assessment Methods and Weighting	Method	s	Details	,	Weighting in final course grade (%)		ssment Method to CLO Mappin	
	Examina	ation	2-hour written exam		50	CL	O 1,2,3,4,5	
	Laborate	ory reports	Practical reports		25	CL	O 1,2,3,4,5	

	Project report	15	CLO 1,2,3,4,5
Required/recommended reading and online materials	Tarbuck E.J. and Lutgens F.K.: The Earth: An Introduction	n to Physical Geology (la	test edition)

EASC1403 Geological h	eritage of Ho	ng Ko	ong (6 credits)			Academic Yea	r 20	15		
Offering Department	Earth Science	Earth Sciences Qu					35			
Course Co-ordinator	Prof M F Zho	F Zhou, Earth Sciences (mfzhou@hku.hk)								
Teachers Involved	Prof M F Zho	of M F Zhou, Earth Sciences grave an overview of the geology of Hong Kong, potential geological resources for tourism and the role of								
Course Objectives		give an overview of the geology of Hong Kong, potential geological resources for tourism and the role cology in the development of Hong Kong's infrastructure.								
Course Contents & Topics	geological k	nowled	neral geology of Hong Kong, go lge pertaining to large scale c al of 32 hours) guided by experts	onst	truction project pl	us at least 4				
Course Learning Outcomes	on successf	ul com	pletion of this course, students sh	nould	d be able to:					
	CLO 1 acq	CLO 1 acquire an appreciation of the processes leading to the formation of various landforms								
	CLO 2 den	nonstra	te understanding of the major mo	orph	ological features ir	Hong Kong				
		ance thursion	he observation and analytical sk	kills,	and physical abili	ty through par	ticipation	in the field		
	CLO 4 und	lerstand	ding the different impacts on / imp	porta	ance of geological	heritage of Ho	ng Kong			
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL									
Offer in 2015 - 2016	Y 2nd se	em			E	Examination	Ma	ay		
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors		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.								
		B Demonstrate substantial understanding at an advanced level of extensive knowledge and skills with evidence for attaining all the course learning outcomes. Show analytical and critical abilities and logical thinking. Evidence of original thoughts and abilities of field observation. Effective organization and presentation skills.								
		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 o 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 critical abilities, logical and coherent thinking. Very little or no ability for field observation and for solving problems. For organization and presentational skills.								
Course Type	Lecture-base	ed cour	se							
Course Teaching	Activities			De	tails		No	o. of Hours		
& Learning Activities	Lectures			6 s	6 sessions x 2 hours			12		
	Field work				4 field trips (3 compulsory guided field trips + 1 self-decided trip)			32		
	Group work			1 p	1 presentation and report			20		
	Reading / S	elf stuc	dy					60		
	Assessmen	t		1 e	essay			20		
Assessment Methods and Weighting	Methods		Details		Weighting in fin			nt Methods O Mapping		
	Assignment	ts	attendance of 3 compulso guided field trips	ory	:	20 (CLO 1,2,3	,4		
	Essay		1 individual essay		:	20 (LO 1,2,3	,4		
	Examination	n	2-hour written examination		•	40	CLO 1,2,	4		
	Presentatio	n	1 group presentation			10 (LO 1,2,3	3,4		
	Project repo	ort	1 group project			10 (LO 1,2,3	. 4		

EASC1404 Early life on e	arth (6 credits)	Academic Year	2015
Offering Department	Earth Sciences	Quota	50

Teachers Involved	_						
	Dr K H Le	Dr K H Lemke, Earth Sciences					
Course Objectives	thought to	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	first ocean	ns; the o	over the following topics: the co central role of water in life; abu Solar system; possible conditions early life on Earth and the search	indance of biologics for the synthesis	cal elements on of life's first build	the early Earth an ling blocks; the (geo	
Course Learning Outcomes	On succes	ssful con	npletion of this course, students s	should be able to:			
	CLO 1 d	lescribe	the basic physical and chemical	conditions on the ea	arly Earth		
	CLO 2 e	xplain a	nd describe the role of water ar		•	s in the synthesis o	
			nd the role that different geologic	al environments pla	yed during the o	origins of life	
	CLO 4 id	dentify cl	hallenges associated with each s	tep in the origins of	life		
	CLO 5 ir	nvestigat	te a current origins of life topic				
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL						
Offer in 2015 - 2016	N				Examination		
Offer in 2016 - 2017	N						
Course Grade	A+ to F						
Grade Descriptors	A	all cou original life" top Life pro presen	Student demonstrates thorough mastery at an advanced level of extensive knowledge and skills required for attaining all course learning outcomes. Shows strong analytical and critical abilities and logical thinking, with evidence of original thought, and the ability to apply his/her knowledge to a wide range of problems that center around "origins of life" topics, and at the same, can combine knowledge from the natural sciences to better understand potential early Life processes on Earth and elsewhere. Student shows the ability to apply highly effective organizational and presentational skills.				
	В	Student demonstrates 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 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 sciences to better understand potential early Life processes on Earth and elsewhere. Student shows the ability to apply effective organizational and presentational skills.					
			ere. Ottaterit sriows the ability to apply en	fective organizational ar		the same, is capable to processes on Earth and	
	С	Studen course apply h	it demonstrates general but incomplete learning outcomes. Show evidence of s sis/her knowledge to a range of problems ately effective organizational and present	command of knowledge ome analytical and critic in the field of the "orig	nd presentational skil e and skills required cal abilities and logic	the same, is capable to processes on Earth and ls. for attaining most of the cal thinking, and ability to	
	C	Studen course apply h modera Studen learning abilities	t demonstrates general but incomplete learning outcomes. Show evidence of sais/her knowledge to a range of problems	command of knowledge ome analytical and critic is in the field of the "orig attional skills. and of knowledge and s toherent and logical thi opics in the "origins of	d presentational skills and skills required cal abilities and logic ins of life". Student skills required for attanking, but with limit	the same, is capable to processes on Earth and is. for attaining most of the cal thinking, and ability to shows the ability to apply unining some of the course and analytical and critical	
		Studen course apply honorer Studen learning abilities limited Studen learning to apply	It demonstrates general but incomplete learning outcomes. Show evidence of s bis/her knowledge to a range of problems ately effective organizational and present at demonstrates partial but limited comma g outcomes. Show evidence of some cs. Show limited ability understand key to	command of knowledge ome analytical and critic is in the field of the "origational skills. and of knowledge and sopherent and logical thippics in the "origins of sentational skills.	and skills required cal abilities and logic ins of life". Student skills required for attanking, but with limit life" field. Student see and skills required oberent thinking. Sho	the same, is capable to processes on Earth and its. for attaining most of the call thinking, and ability to shows the ability to apply an ining some of the course analytical and critical hows the ability to apply the course of the course the course of the course	
Course Type	D Fail	Studen course apply h modera Studen learning abilities limited Studen learning to apply minima	It demonstrates general but incomplete learning outcomes. Show evidence of s isis/her knowledge to a range of problems ately effective organizational and presents t demonstrates partial but limited comma g outcomes. Show evidence of some cs. Show limited ability understand key to or barely effective organizational and prest demonstrates little or no evidence of g outcomes. Lack of analytical and critically knowledge to understand basic topics of the state	command of knowledge ome analytical and critic is in the field of the "origational skills. and of knowledge and sopherent and logical thippics in the "origins of sentational skills.	and skills required cal abilities and logic ins of life". Student skills required for attanking, but with limit life" field. Student see and skills required oberent thinking. Sho	the same, is capable to processes on Earth and its. for attaining most of the call thinking, and ability to shows the ability to apply an ining some of the course analytical and critical hows the ability to apply the course of the course the course of the course	
Course Teaching	D Fail	Studen course apply hymodera Studen learning abilities limited Studen learning to apply minima	It demonstrates general but incomplete learning outcomes. Show evidence of s isis/her knowledge to a range of problems attely effective organizational and presents to demonstrates partial but limited comma g outcomes. Show evidence of some cos. Show limited ability understand key to or barely effective organizational and present demonstrates little or no evidence of goutcomes. Lack of analytical and critically knowledge to understand basic topics of ally effective or ineffective.	command of knowledge ome analytical and critic is in the field of the "origational skills. and of knowledge and sopherent and logical thippics in the "origins of sentational skills.	and skills required cal abilities and logic ins of life". Student skills required for attanking, but with limit life" field. Student see and skills required oberent thinking. Sho	the same, is capable to processes on Earth and its. for attaining most of the call thinking, and ability to shows the ability to apply an analytical and critical hows the ability to apply the course of the cours	
Course Teaching	D Fail	Studen course apply hymodera Studen learning abilities limited Studen learning to apply minima	It demonstrates general but incomplete learning outcomes. Show evidence of s isis/her knowledge to a range of problems attely effective organizational and presents to demonstrates partial but limited comma g outcomes. Show evidence of some cos. Show limited ability understand key to or barely effective organizational and present demonstrates little or no evidence of goutcomes. Lack of analytical and critically knowledge to understand basic topics of ally effective or ineffective.	command of knowledge ome analytical and critis in the field of the "orig attional skills. and of knowledge and s toherent and logical this opics in the "origins of sentational skills. command of knowledge al abilities, logical and co- elated to the origins of least	and skills required cal abilities and logic ins of life". Student skills required for attanking, but with limit life" field. Student see and skills required oberent thinking. Sho	the same, is capable to processes on Earth and is. for attaining most of the call thinking, and ability to shows the ability to apply the course and analytical and critical hows the ability to apply the course and the course the course and the course the course and the course ows very little or no ability of presentational skills are	
Course Teaching	D Fail Lecture wi	Studen course apply homodera Studen learning abilities limited Studen learning to apply minima	It demonstrates general but incomplete learning outcomes. Show evidence of s isis/her knowledge to a range of problems attely effective organizational and presents to demonstrates partial but limited comma g outcomes. Show evidence of some cos. Show limited ability understand key to or barely effective organizational and present demonstrates little or no evidence of goutcomes. Lack of analytical and critically knowledge to understand basic topics of ally effective or ineffective.	command of knowledge ome analytical and critis in the field of the "orig attional skills. and of knowledge and s toherent and logical this opics in the "origins of sentational skills. command of knowledge al abilities, logical and co- elated to the origins of least	and skills required cal abilities and logic ins of life". Student skills required for attanking, but with limit life" field. Student see and skills required oberent thinking. Sho	the same, is capable to processes on Earth and its. for attaining most of the call thinking, and ability to shows the ability to apply the course and the course of the course	
Course Teaching	D Fail Lecture wi	Studen course apply homodera Studen learning abilities limited Studen learning to apply minima sith labora s	It demonstrates general but incomplete learning outcomes. Show evidence of s learning outcomes. Show evidence of s sis/her knowledge to a range of problems attely effective organizational and presents it demonstrates partial but limited comma g outcomes. Show evidence of some cs. Show limited ability understand key to or barely effective organizational and prest demonstrates little or no evidence of goutcomes. Lack of analytical and critically knowledge to understand basic topics rully effective or ineffective.	command of knowledge ome analytical and critis in the field of the "orig attional skills. and of knowledge and s toherent and logical this opics in the "origins of sentational skills. command of knowledge al abilities, logical and co- elated to the origins of least	and skills required cal abilities and logic ins of life". Student skills required for attanking, but with limit life" field. Student see and skills required oberent thinking. Sho	the same, is capable to processes on Earth and is. for attaining most of the call thinking, and ability to shows the ability to apply the course and analytical and critical hows the ability to apply the course of the course of the course and the course of the course and the course of the course	
Course Teaching & Learning Activities Assessment Methods	D Fail Lecture wi Activities Lectures Laborator	Studen course apply homodera Studen learning abilities limited Studen learning to apply minima sith labora s	It demonstrates general but incomplete learning outcomes. Show evidence of s learning outcomes. Show evidence of s sis/her knowledge to a range of problems attely effective organizational and presents it demonstrates partial but limited comma g outcomes. Show evidence of some cs. Show limited ability understand key to or barely effective organizational and prest demonstrates little or no evidence of goutcomes. Lack of analytical and critically knowledge to understand basic topics rully effective or ineffective.	command of knowledge ome analytical and critis in the field of the "orig attional skills. and of knowledge and s toherent and logical this opics in the "origins of sentational skills. command of knowledge al abilities, logical and co- elated to the origins of least	d presentational skills and skills required call abilities and logic ins of life". Student skills required for attanking, but with limit life" field. Student see and skills required obserent thinking. Should be compared to the comparization and skills required observent thinking. Should be compared to the comparization and skills required observent thinking. Should be compared to the comparization and skills required observent thinking. Should be compared to the comparization and skills required to the compared to the comparization and skills required to the compa	the same, is capable to processes on Earth and is. for attaining most of the call thinking, and ability to shows the ability to apply the course and analytical and critical hows the ability to apply the course of the course o	
Course Teaching & Learning Activities Assessment Methods	Pail Lecture with Activities Lectures Laborator Reading	Studen course apply I modera Studen learning abilities limited Studen learning to apply minima sith labora s	It demonstrates general but incomplete learning outcomes. Show evidence of s learning outcomes. Show evidence of s lisi/her knowledge to a range of problems ately effective organizational and presents to demonstrates partial but limited comma g outcomes. Show evidence of some of some list of the state of some learning to show the state of show the show the state of show the	command of knowledge ome analytical and critis in the field of the "orig attional skills. and of knowledge and shoherent and logical this pics in the "origins of sentational skills. command of knowledge and shoherent and logical this pics in the "origins of sentational skills. command of knowledge and shoherent and logical this pick in the "origins of labilities, logical and command to the origins of labilities, logical and collected to the origins of labilities. Details Weighting in course grade	d presentational skills and skills required call abilities and logic ins of life". Student skills required for attanking, but with limit life" field. Student see and skills required obserent thinking. Should be compared to the comparization and skills required observent thinking. Should be compared to the comparization and skills required observent thinking. Should be compared to the comparization and skills required observent thinking. Should be compared to the comparization and skills required to the compared to the comparization and skills required to the compa	the same, is capable to processes on Earth and is. for attaining most of the call thinking, and ability to apply the course and critical and critical hows the ability to apply the course of the course of analytical and critical hows the ability to apply the course of	
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	D Fail Lecture wi Activities Lectures Laborator Reading	Studen course apply I modera Studen learning abilities limited Studen learning to apply minima state apply m	It demonstrates general but incomplete learning outcomes. Show evidence of s learning outcomes. Show evidence of s list/her knowledge to a range of problems ately effective organizational and presents to demonstrates partial but limited commas g outcomes. Show evidence of some of some learning to show the standard service or barely effective organizational and presents to demonstrates little or no evidence of goutcomes. Lack of analytical and critically knowledge to understand basic topics of a standard services or ineffective. Attory component course Details 1 midterm, group presentation	command of knowledge ome analytical and critis in the field of the "orig attional skills. and of knowledge and shoherent and logical this pics in the "origins of sentational skills. command of knowledge and shoherent and logical this pics in the "origins of sentational skills. command of knowledge and shoherent and logical this pick in the "origins of labilities, logical and command to the origins of labilities, logical and collected to the origins of labilities. Details Weighting in course grade	and skills required cal abilities and logic ins of life". Student skills required for attanking, but with limit life" field. Student see and skills required oberent thinking. Should be considered the consideration and stills required before the consideration and stills required before thinking. Should be considered the consideration and stills required before thinking. Should be considered thinking.	the same, is capable to processes on Earth and is. for attaining most of the call thinking, and ability to shows the ability to apply the course and analytical and critical hows the ability to apply the course of the course o	

EASC1405 Peaceful use of	f nuclear technologies (6 credits)	1	Academic Year	2015			
Offering Department	Earth Sciences	(Quota				
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 technologic daily life and to invoke an awareness of current applications of nuclear sciences by case studies.					
Course Contents & Topics							

	engineeri	ng, biolo	n; principles of nuclear techno ogical, physical and social scier lues; nuclear techniques in med	nces; r	adiation on earth and be	eyond; inc	dustrial application		
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 r	ecogniz	e the science fundamentals in n	nuclear	technologies				
	CLO 2	CLO 2 explain and describe the principles of nuclear technologies applied							
	CLO 3 have the awareness of current applications of nuclear sciences								
			rate the knowledge and unde echnologies	erstand	ding of the underlying	concepts	associated with		
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL	NIL							
Offer in 2015 - 2016	Y 1st	sem			Examin	ation	Dec		
Offer in 2016 - 2017	Υ				'		'		
Course Grade	A+ to F								
Grade Descriptors	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 origina thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.					h evidence of original		
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentations.					g, and 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.								
	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 co	urse						
Course Teaching	Activitie	s		Deta	ils		No. of Hours		
& Learning Activities	Lectures						36		
	Tutorials						12		
	Field wo	rk					6		
	Group w	ork					6		
	Project v	vork					6		
	Reading	/ Self st	udy				92		
Assessment Methods and Weighting	Methods	3	Details		Weighting in final course grade (%)		ssment Methods to CLO Mapping		
	Assignm	ents	Group activities and reports		30	С	LO 1,2,3		
	Examina	tion	2-hour		50		LO 1,2,4		
	Project re	eports	Individual Report		20	С	LO 1,3,4		
Required/recommended reading and online materials	To be ann	nounced	,						

EASC2401 Fluid/solid inte	eractions in earth processes (6 credits)	Academic Year	2015			
Offering Department	Earth Sciences	Quota				
Course Co-ordinator	Dr K H Lemke, Earth Sciences (kono@hku.hk)					
Teachers Involved	Dr K H Lemke, Earth Sciences					
Course Objectives	This course provides an overview of the physical and chemical princ	ciples that govern Eart	h processes			
Course Contents & Topics	List topics with approximate number of weeks - Earth in the laboratory, scaling time and space (1) - Introduction to thermodynamics, and the concept of equilibrium (2) - States of matter, phase diagrams - sublimation, condensation, cry Mineral-solution interfaces (1) - Energy exchange in Earth environments: convection, conduction a - Kinetics, reaction rates and isotope fractionation on geological time - Newtonian mechanics and basic laws of motion (1) - Fluid flow and particle transport (1) - Gravitational, geostrophic and centripetal forces (1)	stallisation and melting and radiation (2)	J (2)			
Course Learning Outcomes						

	On succes	ssful cor	mpletion of this course, student	s should be able to:				
	CLO 1 u	understa	nd basic principles of thermody	namics as applied to	the Earth S	Sciences		
	CLO 2 u	CLO 2 use phase diagrams to explain processes of fluid/solid interactions						
	CLO 3 d	describe	how energy is exchanged thro	ughout the Earth Sys	tem			
	CLO 4 d	demonsti	rate an understanding of the ki	netics of geochemica	l reactions			
			end the principles of motion a ls on Earth	nd the basic forces	affecting mo	ovement o	f gases, liquids	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	Pass in EASC1401 Blue planet or EASC1402 Principles of geology						
Offer in 2015 - 2016	Y 2nd	d sem			Examina	tion	May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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.						
	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 w	ith labor	atory component course					
Course Teaching	Activities	s		Details			No. of Hours	
& Learning Activities	Lectures			12 sessions x 2 ho	ur		24	
	Laborato	ry		paper exercises			24	
	Reading	/ Self stu	udy				100	
Assessment Methods and Weighting	Methods	3	Details	Weighting in course grad			ment Methods CLO Mapping	
	Assignme	ents			60	CLO 1	,2,3,4,5	
	Examina	tion			40	CLO 1	,2,3,4,5	
Required/recommended reading and online materials	Kinetics o	of Water-	Rock Interaction (2007) - Brar	itley, Kubicki & White	(Editors).			

EASC2402 Field methods	(6 credits	3)	Academic Year	2015					
Offering Department	Earth So	ciences	Quota						
Course Co-ordinator	Dr P Ba	ch, Earth Sciences (pabach@hku.hk)							
Teachers Involved	Dr P Ba	Dr P Bach, Earth Sciences							
Course Objectives		This course is hands-on field and class-based that introduces basic geological field and mappin techniques and the use of geological equipment and air photographs, an overview of the geology of Hon Kong.							
Course Contents & Topics	- Interprouterop unconforuncerop	- Maps and map reading, map reference system (1 week) - Interpretation of geological maps: topographic and geological cross sections, geological structures froutcrop patterns and structural contour lines (horizontal, inclined strata, folded, and faulted strata, unconformities) (3 weeks) - Interpretation and use of air photographs (1 week) - Geological field techniques and equipment, field observation and description of rocks and outcrops							
Course Learning Outcomes		sessful completion of this course, students should be able							
	CLO 1	read geological maps and comprehend 3-D geological s	tructures from 2-D geolog	ical maps					
	CLO 2	construct a geological cross section showing interpreted	subsurface rocks and str	ructures					
	CLO 3 demonstrate techniques for basic field observations, measurements and identifications								
	CLO 4 create and interpret an internally consistent geological map from a set of collected field observations and data								

		elop skills in integrating geologic ctured field report	cal field data in determ	ining a geolo	gical history and writing a			
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in EASC1401 Blue planet or EASC1402 Principles of geology						
Offer in 2015 - 2016	Y 1st se	1st sem Examination Dec						
Offer in 2016 - 2017	Υ				,			
Course Grade	A+ to F							
Grade Descriptors		Demonstrate thorough and complete grasp of the subject in order to fulfill most or all learning outcomes. Sh strong ability to record observations on earth processes in the field and to apply knowledge to familiar and unfam situations. Evidence of strong independent analytical, critical and logical thinking. Show strong ability to synthesiz observations made and knowledge in a field report and geological map with highly effective organizational presentational skills.						
		Demonstrate substantial grasp of the su record observations on earth processes Evidence of independent analytical, crit and knowledge in a field report and geole	in the field and to apply knowical and logical thinking. Sh	wledge to familiar lows ability to sy	and some unfamiliar situations nthesize all observations made			
		Demonstrate general but incomplete gr some ability to record observations on e Evidence of some independent analytic made and knowledge in a field report an skills.	earth processes in the field al, critical and logical thinkin	and apply knowle ng. Show ability t	edge to most familiar situations of synthesize most observations			
		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.						
		Demonstrate little or no grasp of the sub to record observations on earth process problems. Evidence of little or lack of an no ability to synthesize observations no organizational and poor presentational s	es in the field and show ve alytical and critical abilities, lade and knowledge in a f	ry little or no abi coherent and logi	lity to apply knowledge to solve ical thinking. Shows very little or			
Course Type	Field camps							
Course Teaching	Activities		Details		No. of Hours			
& Learning Activities	Lectures		12 sessions x 1 l	12 sessions x 1 hour				
	Field work		5-day field camp	& 2 day trips	56			
	Laboratory	work	12 hours paper e		12			
	Reading / S	elf study			100			
Assessment Methods and Weighting	Methods	Details	Weighting course gra		Assessment Methods to CLO Mapping			
	Assignment	s 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		sive Course Notes provided. : Basic Geological Mapping (Wile	ey, 1995, 3rd edition)					

EASC2404 Introduction to	atmosph	nere and hydrosphere (6 credits)	Academic Year	2015				
Offering Department	Earth S	Sciences Quota 50						
Course Co-ordinator	Dr J R A	Ali, Earth Sciences (jrali@hku.hk)						
Teachers Involved		Ali, Earth Sciences P C Wu, Earth Sciences						
Course Objectives		is course introduces the atmosphere and hydrosphere systems, and explains at a basic level how the eract with one another.						
Course Contents & Topics	Geologi Seawate Atmosp Hydrolo Systems contami	ction and course plan, Earth within a broader context (cal forces shaping the floor of the Oceans and Seas; er Composition/Chemistry; Introduction to the Atmoshere; Temperature; Moisture and Atmospheric Stability; Figical Cycle - an overview; Air Pressure and Winds; Intros; Ocean Circulation; Waves; Tides; Coasts; Grounation, caves and karst; Glaciers and glacial landscapes change; Effects of climate change.	Water Structure, Ocea sphere; Heating Earth Forms of condensation a to Atmospheric Circulati ndwater basics; Grou	n Structure and s surface and ind precipitation; on and Weather usage,				
Course Learning Outcomes	On succ	cessful completion of this course, students should be able to	o:					
	CLO 1	CLO 1 understand the important features which distinguish Earth from the other planets within our System, particularly with regards to its outer fluid envelopes						
	CLO 2	CLO 2 appreciate that on a geological timescale, the ocean basins and the seas are continuall changing their location and morphology, and why this is the case						
	CLO 3 understand the key features of water, and the critical role the compound plays in the Atmosphere-Hydrosphere system							

		CLO 4 understand the basic physical phenomena associated with the Atmosphere and the Oceans/Seas and their important lower-order elements						
	CLO 5	have an	awareness of the scientific	ally "hot	" Atmosphere and Hy	ydrosphere	topics	
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in EASC1401 Blue planet or EASC1402 Principles of geology						
Offer in 2015 - 2016	Y 1st	t sem			E	Examinatio	n Dec	
Offer in 2016 - 2017	Υ				'		'	
Course Grade	A+ to F							
Grade Descriptors	A	and pr quality	Thorough grasp of the subject; evidence of strong critical abilities and logical thinking; highly effective organization and presentational skills; insightful use and critical analysis / evaluation of information drawn from a full range of highly sources and to quote/reference aptly; integration of the full range of appropriate theories, principles, eviden and techniques.					
	В	preser compa	antial grasp of the subject; ev ntational skills; critical use of trisons between different seco es, principles, evidence and tech	relevant indary inte	information from source	s, showing a	bility to make meaningfu	
	С	General but incomplete grasp of the subject; evidence of some critical abilities and logical thinking; 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; some partial integration of theories, principles, evidence and techniques.						
	D	D Limited grasp of the subject, retention of some relevant information of the subject; evidence of limited critical abilities; limited or barely effective organizational and presentational skills; use and reference of several sources, but mainly through summary rather than analysis and comparison; limited integration of theories, principles, evidence and techniques.						
	Fail	logical	or no grasp of the knowledge a / coherent thinking; incoherent o critical comparison of them; littl	organizatio	on and poor presentations	al skills; limited	d use of secondary sources	
Course Type	Lecture w	vith labor	atory component course					
Course Teaching	Activitie	s		D	etails		No. of Hours	
& Learning Activities	Lectures	3					24	
	Laborato	ory		in	including tutorials & discussion		24	
	Project v	vork					10	
	Reading	/ Self st	udy				90	
Assessment Methods and Weighting	Methods	s	Details		Weighting in fin		Assessment Methods to CLO Mapping	
	Assignm	ents				20	CLO 4,5	
	Essay				:	25	CLO 1,2,3,4,5	
	Examina	ation				50	CLO 1,2,3,4,5	
	Presenta	ation				5	CLO 1,2,3,4,5	
Required/recommended reading and online materials			Oceanography: An Invitatens and Edward J. Tarbuc			duction to M	eteorology	

EASC2406 Geochemistry	(6 credits)	Academic Year	2015
Offering Department	Earth So	ciences	Quota	
Course Co-ordinator	Dr S H I	Li, Earth Sciences (shli@hku.hk)		
Teachers Involved	Dr S H I	Li, Earth Sciences		
Course Objectives	introduc		fundamentals and approaches for geocl nciples, modern techniques and quant	
Course Contents & Topics	- Differe - Aqueo - Trace - Chemi - Chemi - Radioa - Stable - Oxidat - Atmos	al and chemical state of the earth, ntiation of and cosmic abundance of ele us solutions and chemistry of natural wa element, stry of igneous rocks, cal controls on soil formation, active isotope geochemistry, isotope geochemistry, ion and reduction, pheric chemistry, cal weathering		
Course Learning Outcomes	On succ	essful completion of this course, student	ts should be able to:	
	CLO 1	demonstrate an understanding of bar geological studies	sic principles of geochemistry and the	eir applications to
	CLO 2	describe element distribution in major re	ocks	

	CLO 3 app	ly the principles of isotopes	to dating and	studies of petrogenesis	and climate	changes		
	CLO 4 dem	CLO 4 demonstrate knowledge of the chemical weathering processes						
Pre-requisites (and Co-requisites and Impermissible combinations		C1402 Principles of geology						
Offer in 2015 - 2016	Y 1st se	m		Exami	nation	Dec		
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors		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.						
		Demonstrate substantial command course learning outcomes. Show e effective lab skills and techniques the Apply effective organizational and process.	vidence of anal to solve problen	ytical and critical abilities and I	ogical thinking	, and ability to apply		
		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 component cours	е					
Course Teaching	Activities		De	etails		No. of Hours		
& Learning Activities	Lectures		12	sessions x 2 hours		24		
	Laboratory		ра	per exercises		24		
	Tutorials					6		
	Reading / S	elf study				100		
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)		sment Methods to CLO Mapping		
	Assignment	s		40	CLC	1,2,3,4		
	Examination	1		60	CLC	1,2,3,4		
Required/recommended reading and online materials	Krauskopf K.	ciple and applications of Ge B. and Bird D.K. Introduction : Essentials of Geochemistry	n to Geocher	mistry (McGraw-Hill, Inc.	1995, 3rd e	d.)		

EASC2407 Mineralogy (6 o	redits)			Academic Year	2015			
Offering Department	Earth Sciences Quota 30							
Course Co-ordinator	Prof M	un, Earth Sciences (minsun@hku.hk)						
Teachers Involved		un, Earth Sciences Earth Sciences						
Course Objectives		de essential knowledge of mineralogy, to of petrography of igneous, sedimentary a			als that are basis			
Course Contents & Topics	- Minera - Physic - Minera - Identif - Use of - Optica - Optica - Optica - Identif - Precio - Chemi - Trace	crystallization, mineral chemistry symmetry, Miller indices al properties of minerals composition, structure and classification cation of rock forming minerals-hand specipetrographic microscope properties under plane polarized light properties under orthoscopic illumination properties under conoscopic illumination cation of rock forming minerals-thin sections minerals cal variations of minerals elements ent analysis for minerals						
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 describe the methods and systems used in classification of minerals							
	CLO 2 apply the physical and chemical properties used in identification of rock-forming mineralogy and mineral structure							
	CLO 3	describe the principle of optical mineralog	Jy					

	CLO 4 id	dentify th	ne common rock-forming mine	rals ir	n hand specimens a	nd thin sec	ions	
	CLO 5 u	CLO 5 understand some principles of mineral chemistry						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	Pass in EASC1402 Principles of geology						
Offer in 2015 - 2016	Y 1st	sem			E	xaminatio	n Dec	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	outcon skills	nstrate extensive knowledge and skil nes. Show strong analytical and critic and techniques to solve problems. sions. Apply highly effective organizati	al abil Critica	lities and logical thinking al use of data and res	g, and ability t	o apply highly effective lab	
	В	course	nstrate substantial command of a broa learning outcomes. Show evidence of ve lab skills and techniques to solve p effective organizational and presentati	of anal roblem	lytical and critical abilities ns. Correct use of data o	s and logical t	hinking, and 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 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 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 w	ith labor	atory component course					
Course Teaching	Activities						No. of Hours	
& Learning Activities	Lectures			12 sessions x 2 hours			24	
	Laborato	ry		12 sessions x 2 hours			24	
	Reading	•	udy	5555.5.15 % _ 119419		100		
Assessment Methods and Weighting	Methods	•	Details		Weighting in fin		Assessment Methods to CLO Mapping	
	Assignme	ents				50	CLO 1,2,3,4,5	
	Examinat	tion				50	CLO 1,2,3,4,5	
Required/recommended reading and online materials			Hurlbat: Manual of Mineralogy duction to Optical Mineralogy (•	• • • • • • • • • • • • • • • • • • • •	1998, 2nd	ed).	

EASC2408 Planetary geolo	gy (6 cr	edits)	Academic Year	2015				
Offering Department	Earth S	ciences	Quota					
Course Co-ordinator	Dr M H	Lee, Earth Sciences (mhlee@hku.hk)						
Teachers Involved	Dr M H	Lee, Earth Sciences						
Course Objectives	distribut and ring point of remote	his course provides students with an introduction to the origin, evolution, structure, composition a stribution of matter in the Solar System condensed in the form of planets, satellites, comets, asteroid rings, with particular emphasis on surface features, internal structures and histories from a geologic int of view. The course incorporates the findings from recent space investigations, planetary image mote sensing and Earth analogues to extraterrestrial features into a fascinating portrayal of the cological activities and histories in our Solar System.						
Course Contents & Topics	Mercury and the	Formation, evolution, internal structure and surface processes of planetary bodies; the terrestrial plane Mercury, Venus, the Earth-Moon system, and Mars; the giant planets Jupiter, Saturn, Uranus, and Neptur and their moons; Pluto, Charon and the Kuiper Belt; asteroids, meteorites, comets and the Oort clou Origin of our Solar System.						
Course Learning Outcomes	On succ	cessful completion of this course, students should be able to:						
	CLO 1	CLO 1 describe the basic features of our Solar System and its constituents						
	CLO 2	CLO 2 explain how this knowledge is acquired through observations and experiments						
	CLO 3	demonstrate knowledge and understanding of the key processes governing the structure, formation and evolution of		l and chemical				
	CLO 4	CLO 4 compare and contrast our own planet Earth with other planetary bodies						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	EASC1401 Blue planet or EASC1402 Principles of geology or	PHYS1650 Nature of	of the universe				
Offer in 2015 - 2016	Y 2	and sem	Examination	Mav				

Offer in 2016 - 2017	Y							
Course Grade	A+ to F	A+ to F						
Grade Descriptors	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.						
	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	learnin	nstrate general but incomplete comm g outcomes. Show evidence of some edge to most familiar situations. Apply	e analy	tical and critical abilities and lo	gical thinking, and ability to apply		
	D	outcon	nstrate partial but limited command of nes. Show evidence of some coheren ability to apply knowledge to so stational skills.	t and lo	ogical thinking, but with limited ar	nalytical and critical abilities. Show		
	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 wit	h labor	atory component course					
Course Teaching	Activities			De	tails	No. of Hours		
& Learning Activities	Lectures			12	sessions x 2 hours	24		
	Laboratory			12	sessions x 2 hours	24		
	Reading /	Self st	udy			100		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	nts			20	CLO 1,2,3,4		
	Examinati	on			50	CLO 1,2,3,4		
	Presentati	ion			15	CLO 1,2,3,4		
	Test				15	CLO 1,2,3,4		
Required/recommended reading and online materials	N. McBride	and I.	Gilmour: An Introduction to the	e Sola	ar System (Cambridge Uni	versity Press, 2004)		

EASC2409 Regional field	studies (6	credits)	Academic Year	2015			
Offering Department	Earth Sciences Quota 4						
Course Co-ordinator	Dr J R A	li, Earth Sciences (jrali@hku.hk)					
Teachers Involved	Prof M S Dr S C (Dr J A k	oli, Earth Sciences Sun, Earth Sciences Chang, Earth Sciences Ing, Earth Sciences Jiao & Prof M F Zhou, Earth Sciences					
Course Objectives	Kong th	urse is field-based and introduces geology of China rough hands on studies and field excursions. rse will be compulsory for majors in Geology (accred		the vicinity of Hon			
Course Contents & Topics	Geologi - Geolog - Recog - Field r - Stratig - Field g - Engine - Manag	rse will introduce the following topics: cal studies in Southern China and/or Taiwan gical history of S. China & Taiwan nition of rock units and minerals in the field ecognition and description of geological structures raphic measurements ecology of active and passive margins ering geology ement of geological hazards geological mapping techniques					
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1 have acquired a broad understanding of the geology of east Asia, in particular, Taiwan and South China						
	CLO 2 be able to undertake basic field observations, stratigraphic measurements and identifications of rocks and minerals						
	CLO 3 have acquired at least 3 days of experience in independent stratigraphic logging and geological mapping						
	CLO 4 develop skills in integrating geological field data in determining a geological history and writing a structured field report						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	EASC1401 Blue planet or EASC1402 Principles of g	eology and consent of cour	se coordinator			

Offer in 2015 - 2016	Y 1st se	Y 1st sem Examination No Ex					
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	^`	Demonstrate an advanced level of understa of the geological history of the study region, field measurements.					
		Demonstrate a satisfactory understanding of the geology of the study sites with evidence on efforts to unravel the geological history of the study region and acceptable level of competence in field measurement techniques.					
		Could only demonstrate an incomplete unde observations and a basic knowledge on field		dy sites and so	ome ability to make field		
		Demonstrate limited understanding of the geology of the study sites and limited ability to apply field measurement techniques.					
		Show no or little knowledge of the geology of the study sites and lack of ability in making field observations and applying field measurement techniques.					
Course Type	Field camps						
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Field work		15 days		100		
	Reading / S	elf study			20		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Ass	essment Methods to CLO Mapping		
	Report		100	CLO	O 1,2,3,4		
Required/recommended reading and online materials	Comprehens	sive course notes provided					

EASC3020 Global change	e: anthropo	genic impacts (6 credits)	Academic Year	2015
Offering Department	Earth Scien	ces	Quota	
Course Co-ordinator	Dr Z H Liu,	Earth Sciences (zhliu @hku.hk)		
Teachers Involved	Dr Z H Liu,	Earth Sciences		
Course Objectives		e will explore the role of humans in global change and that auses and impacts of climate change will be discussed.	ne environmental res	ponses to suc
Course Contents & Topics	evolution, n	ming, greenhouse gas emission, past climates, climatic an natural vs. anthropogenic climate change, model projections impacts of climate change, including sea level, fresh water, f	s of future climate cl	hange, scientifi
Course Learning Outcomes	On success	ful completion of this course, students should be able to:		
	CLO 1	recognise the complexity of global climate systems		
	CLO 2	recognise the controversy of anthropogenic global warming]	
	CLO 3	identify modern environmental issues		
	CLO 4	assess the credibility of various scientific arguments		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in EA course	SC2404 Introduction to atmosphere and hydrosphere or EN	IVS2001 Environmer	tal field and la
Offer in 2015 - 2016	N		Examination	
Offer in 2016 - 2017	Υ			
Course Grade	A+ to F			
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowl course learning outcomes. Show strong analytical and critical abilities a thought, and ability to apply knowledge to a wide range of complex, far critical use of data and results to draw appropriate and insightful conclusic evaluation of information drawn from a full range of high quality sources and	nd logical thinking, with e miliar and unfamiliar situa ons. Show insightful use ar	vidence of original tions. Demonstrate
	В	Demonstrate substantial command of a broad range of knowledge and sk course learning outcomes. Show evidence of analytical and critical abilit knowledge to familiar and some unfamiliar situations. Demonstrate correct conclusions. Show critical use of relevant information from sources and abilitiferent secondary interpretations and to quote/reference aptly.	ties and logical thinking, a t use of data and results t	and ability to apply o draw appropriate
	С	Demonstrate general but incomplete command of knowledge and skills req outcomes. Show evidence of some analytical and critical abilities and logic most familiar situations. Demonstrate mostly correct but some erroneous conclusions. Show use of relevant information from sources and abili interpretations and to quote/reference aptly.	cal thinking, and ability to use of data and results t	apply knowledge to o draw appropriate
	D	Demonstrate partial but limited command of knowledge and skills require outcomes. Show evidence of some coherent and logical thinking, but with limited ability to apply knowledge to solve problems. Demonstrate limit appropriate conclusions. Show use and reference of several sources, but	n limited analytical and cri ted ability to use data a	tical abilities. Shown
		and comparison.		

Demonstrate little or no evidence of command of knowledge and skills required for attaining the outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or knowledge to solve problems. Demonstrate misuse of data and results and/or unable to draw approach Show limited use of secondary sources and no critical comparison of them.					
Course Type	Lecture-based co	urse			
Course Teaching	Activities		Details	No. of Hours	
& Learning Activities	Lectures			36	
	Project work			30	
	Tutorials			12	
	Discussion			24	
	Reading / Self st	udy		48	
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Essay	Coursework Assessment	25	CLO 1,2,4	
	Examination	One 2-hour written examination	n 50	CLO 1,2,4	
	Project report		25	CLO 2,3,4	

EASC3402 Petrology (6 cre	edits)		Academic Year	2015				
Offering Department	Earth Scie	ences	Quota					
Course Co-ordinator	Prof G Zh	Prof G Zhao, Earth Sciences (gzhao@hku.hk)						
Teachers Involved	Prof M Su	ao, Earth Sciences in, Earth Sciences nan, Earth Sciences						
Course Objectives		tudents an understanding of the features in sedime illity to identify major rock types and their textures troscope.						
Course Contents & Topics	including - Basic igr - Intermed - Acid igne - Sedimer rocks Clastic s - Biochem - Metamo classificat - Meta-pe - Meta-ba		ocks; textures and structure	es of sedimentar				
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 identify major igneous rocks and their textures and structures in both hand specimens and under microscope							
	CLO 2 identify major sedimentary rocks and their textures and structures in both hand specimens and under microscope							
	CLO 3 identify major metamorphic rocks and their textures and structures in both hand specimens and under microscope							
	CLO 4 make full description and write report on the above rock types							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	ASC2407 Mineralogy						
Offer in 2015 - 2016	Y 2nd	d sem	Examination	May				
Offer in 2016 - 2017	Υ		<u>'</u>					
Course Grade	A+ to F							
Grade Descriptors	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.							
	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.							

	outc	nonstrate little or no evidence omes. Lack of analytical and covered to solve problems.					
Course Type	Lecture with lab	oratory component cours	6e				
Course Teaching & Learning Activities	Activities		Det	ails		No. of Hours	
a zaming romana	Lectures		12 s	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 (%)	Ass	sessment Methods to CLO Mapping	
	Assignments			50		CLO 1,2,3,4	
	Examination	on		50		CLO 1,2,3,4	
Required/recommended reading and online materials	Harvey Blatt and	d Robert J. Tracy, Petrolo	ogy (Second E	Edition; W.H. Freman a	and Compa	any, New York)	

EASC3403 Sedimentary en	vironmen	ts (6 credits)		Academic Year	2015		
Offering Department	Earth Sci	ences	C	Quota			
Course Co-ordinator	Dr S C C	hang, Earth Sciences (suchin@	Dhku.hk)				
Teachers Involved		Dr S C Chang, Earth Sciences Dr J A King, Earth Sciences					
Course Objectives	Students	This course discusses the origin, diagenesis, classification and economic importance of sedimentary rock Students will learn features and processes of sedimentary geology, paleontology and deposition processes.					
Course Contents & Topics	PhysicsSedimeDepositiDepositiSequenBasin anSedime	 Overview of sedimentary geology Physics of erosion, transportation and sedimentation Sedimentary structures Depositional environments (non-marine) Depositional environments (marine) Sequence stratigraphy Basin analysis Sedimentary environment around Hong Kong Sedimentary environment on Mars 					
Course Learning Outcomes	On succe	essful completion of this course,	students should be able to:				
	CLO 1	CLO 1 describe the nature and significance of sedimentary features and structures					
	CLO 2	CLO 2 identify carbonate and siliciclastic rocks in hand sample					
	CLO 3 describe the facies in a depositional environment						
	CLO 4 undertake detailed study of a stratigraphic section in the field						
	CLO 5 conduct basic observations and interpretations from outcrops						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	ASC2402 Field methods or EA	SC3402 Petrology				
Offer in 2015 - 2016	Y 2n	d sem	E	Examination	May		
Offer in 2016 - 2017	Υ		'		'		
Course Grade	A+ to F						
Grade Descriptors	A	Demonstrate thorough grasp of the subject. Show strong analytical abilities and logical thinking, with evidence or original thought. Apply highly effective lab/fieldwork skills and techniques. Apply highly effective organizational and presentational skills.					
	В	· ·					
	С						
	D Demonstrate partial but limited grasp of the subject. Show some analytical abilities and logical thinki partially effective lab/fieldwork skills and techniques. Apply limited or barely effective organizati presentational skills.						
	Fail						
Course Type	Lecture w	vith laboratory component cours	se				
Course Teaching & Learning Activities	Activitie	es .	Details		No. of Hours		
a Learning Activities	Lectures	;	12 sessions x 2 hour	rs	24		
		Laboratory 6 sessions x 2 ho					

	Field work		1 day t	rip with field project	8
	Project work		Examp	oles for sediment nments	tary 12
	Reading / Self study	,			90
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Examination			40	CLO 1,2,3,4
	Laboratory reports			20	CLO 1,2,3,4,5
	Presentation			10	CLO 3
	Test	Mid-term examination		30	CLO 1,2,3
Required/recommended reading and online materials	Sedimentology and S	Stratigraphy (Second Edition)	, Gary N	lichols	

EASC3404 Structural geol	logy (6 cred	dits)	Acader	mic Year	2015		
Offering Department	Earth Scie	ences	Quota		40		
Course Co-ordinator	Dr J R Ali,	Earth Sciences (jrali@hku.hk)					
Teachers Involved	Dr J R Ali,	Earth Sciences					
Course Objectives		se covers the mechanical prope use in interpreting structure.	rties of rocks and how and why roc	ks deform,	geological map		
Course Contents & Topics	- Strain tyl - Stereone - Faults: s - Joints; - Extensio - Folds; - Shear Zo - Fabrics (- Pressure - Microsco - Structura	ereonets; ults: strike-slip faults, dip-slip faults and thrusts; nts; tensional structures, listric faults; lds; Satellite folds; ear Zones; brics (foliations, lineations); essure solution cleavages; croscopic deformation, Dislocations; ucturally focused map interpretation; y Structures in HK.					
Course Learning Outcomes	On succes	ssful completion of this course, s	tudents should be able to:				
	CLO 1	understand a moderate lev	understand a moderate level rock deformation				
	CLO 2	interpret structural data from a geology map					
	CLO 3	plot and interpret structural data on a stereonet					
	CLO 4	appreciate 3D rock and 4D	rock-time relationships				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	Pass in EASC2402 Field methods and EASC3402 Petrology					
Offer in 2015 - 2016	Y 1st	sem	Examir	nation	Dec		
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	range of complex, familiar and unfamiliar situations; highly effective fieldwork skills and techniques; critical use of data and results to draw appropriate and insightful conclusions; integration of the full range of appropriate theories principles, evidence and techniques.					
	B Substantial grasp of the subject; evidence of critical abilities and logical thinking; apply knowledge to familiar and some unfamiliar situations; effective fieldwork skills and techniques; correct use of data and results to draw appropriate conclusions; general integration of theories, principles, evidence and techniques.						
	General but incomplete grasp of the subject; evidence of some critical abilities and logical thinking; apply knowledge to most familiar situations; moderately effective fieldwork skills and techniques; mostly correct but some erroneous use of data and 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 and results to draw appropriate conclusions; limited integration of theories, principles, evidence and techniques.						
	Fail						
Course Type	Lecture w	ith laboratory component course					
Course Teaching	Activitie	S	Details		No. of Hour		
& Learning Activities	7 1011 11110	_	Details		No. or Hour		

	Laboratory		stereonets, map interput with a structural focus	oretation	22
	Field work		3 days field work		24
	Project work		additional 1-2 days self directed 'field' studies of facing stones showing interesting structural features		20
	Reading / Self stu	udy			50
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	As	ssessment Methods to CLO Mapping
	Assignments		50		CLO 1,2,3,4
	Examination		50		CLO 1,2,3,4
Required/recommended reading and online materials		dations of Structural Geology (B olds 1996; Ben A. van der Pluijn		1.	
Additional Course Information	Structural geology are not required p	/ has lots of associated textboourchases.	oks and web hosted materi	als, so th	ne three named works

EASC3405 Environmental	remote se	nsing (6 credits)		Academic Year	2015			
Offering Department	Earth Sci	ences		Quota	25			
Course Co-ordinator	TBC, Ear	th Sciences ()						
Teachers Involved	TBC, Ear	th Sciences						
Course Objectives	from a dis	This course provides an introduction to the methods and applications of remote sensing for measurin rom a distance with instruments carried by satellites or aircraft, the spectral features of the earth's surface and atmosphere for inferring the nature and characteristics of the land, vegetation, seasurface and atmosphere and for solving environmental problems.						
Course Contents & Topics	2. Key rer 3. Image 4. Integra	Basic princioles of remotesensing Key remote sensing platforms, sensers and their purposes Image procesing, analysis, evaluation and interpretation Integration with environmental geographic information systems Applications of remote sensing for environmental management						
Course Learning Outcomes	On succe	ssful completion of this course, studer	nts should be able to:					
	CLO 1	demonstrate knowledge of how remotely sensed data are acquired						
	CLO 2	comprehend the basic techniques of	f image processing					
	CLO 3							
	CLO 4 understand how remotely sensed be used for environmental assessment							
	CLO 5 evaluate and interpret remotely sensed data							
	CLO 6 present and discuss results							
Pre-requisites (and Co-requisites and Impermissible combinations)		BIOL2306 Ecology and evolution or E 01 Environmental field and lab course			d hydrosphere c			
Offer in 2015 - 2016	N			Examination				
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	Excellent, well organised structure appropriate to report. Clear and consistent organisation. All sections clearly written and laid out, very clear and precise summary and conclusions. Appropriate use of clear, well chosen very good graphs, diagrams, figures, tables and maps. Results critically assessed and discussion well organised and supported by wide background reading.						
	В							
	С	C Adequate structure. Presentation and writing is satisfactory, summary and/or conclusions lack sharpness. Satisfactory use of appropriate graphs, diagrams, figures, tables and maps. Competent, straightforward analysis and discussion of results.						
	D	D Basic organisation, lacks clarity of thought. Adequate presentation, style of writing makes some parts difficult follow. Summary and conclusions rather basic. Limited use of often poorly selected and executed graphs, diagram figures, tables and maps. Limited analysis and discussion of results, possibly some misunderstanding of the data.						
	Fail Poor organisation, lacking coherence. Poorly written, summary and /or conclusions rudimentary. Limited use of ofter inappropriate and poorly executed graphs, diagrams, figures, tables and maps. Little or no interpretation of results, or misinterpretation of the results. Discussion very basic or absent.							
Course Type	Lecture w	rith laboratory component course						
Course Teaching	Activitie	s	Details		No. of Hours			
& Learning Activities	Lectures				20			
	Laborato	in/			12			

	Project work			12
	Discussion Reading / Self study			6
				100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		30	
	Examination		40	
	Project report	Individual project report	30	
Required/recommended reading and online materials	Computer proces	and Image Interpretation [6th edsigns of remotely sensed images emote sensing and system analyses	an introduction, Mather and	
Additional Course Information	Due to the restric	ction of lab space, places		

EASC3406 Reconstruction	ot past cli	mate (6 credits)		Academic Year	2015			
Offering Department	Earth Scie	nces		Quota				
Course Co-ordinator	Dr S H Li,	Earth Sciences (shli@hku.hk)						
Teachers Involved	- ,	Earth Sciences Zong, Earth Sciences						
Course Objectives		e provides students with an understand 6 million years. This course introduces	•		•			
Course Contents & Topics	Ice sheet i Driven ford Quantitativ Pollen and Climate ch Quaternar Sea-level a Climate ch	ernary period (1), n north hemisphere(1), ces of climate change (1) ve reconstruction methods (1) allysis and biological proxies (2) lange in arid regions (1) y geochronology (1) and coastal change (1) langes in East Asia (1) lange impacts on human evolution and rming and future climate change (1)	society (1)					
Course Learning Outcomes	On succes	ssful completion of this course, students	s should be able to:					
	CLO 1 understand the earth climate change during last 2.6 million years							
	CLO 2							
	CLO 3 learn the methods for palaeo-environment reconstruction							
	CLO 4 understand the impacts of climate changes							
	CLO 5	synthesize and interpret data sets of	-	es				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in EA	ASC2401 Fluid/solid interactions in eart	h processes					
Offer in 2015 - 2016	Y 2nd	sem		Examination	May			
Offer in 2016 - 2017	N							
Course Grade	A+ to F							
Grade Descriptors	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 origina 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	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	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						
			ve problems. Apply limite		organizational and			
	Fail	limited ability to apply knowledge to solv	and of knowledge and skill ties, logical and coherent the	ed or barely effective is required for attaining ninking. Show very little	the course learning or no ability to apply			
Course Type		limited ability to apply knowledge to solv presentational skills. Demonstrate little or no evidence of comma outcomes. Lack of analytical and critical ability	and of knowledge and skill ties, logical and coherent the	ed or barely effective is required for attaining ninking. Show very little	the course learning or no ability to apply			
Course Teaching		limited ability to apply knowledge to solv presentational skills. Demonstrate little or no evidence of comma outcomes. Lack of analytical and critical abilit knowledge to solve problems. Organization arth laboratory component course	and of knowledge and skill ties, logical and coherent the	ed or barely effective is required for attaining ninking. Show very little	the course learning or no ability to apply			
Course Teaching	Lecture wi	limited ability to apply knowledge to solv presentational skills. Demonstrate little or no evidence of comma outcomes. Lack of analytical and critical abilit knowledge to solve problems. Organization arth laboratory component course	and of knowledge and skill lies, logical and coherent the d presentational skills are	ed or barely effective is required for attaining ninking. Show very little minimally effective or ine	the course learning or no ability to apply ffective.			
Course Type Course Teaching & Learning Activities	Lecture wi	limited ability to apply knowledge to solv presentational skills. Demonstrate little or no evidence of comma outcomes. Lack of analytical and critical abilit knowledge to solve problems. Organization arth laboratory component course	and of knowledge and skill ities, logical and coherent the nd presentational skills are	ed or barely effective is required for attaining ninking. Show very little minimally effective or ine	the course learning or no ability to apply ffective.			

	Tutorials		8 8	8 sessions		16
	Reading / Self study					90
Assessment Methods and Weighting	Methods	ods Details		Weighting in final Asso		ssessment Methods to CLO Mapping
	Assignments			50		CLO 1,2,3,5
	Examination			50		CLO 1,2,3,4
Required/recommended reading and online materials	Longman, 1997, W.F. Ruddiman:	N.J.C. Walker Reconstructing (2nd ed) Earths climate: Past and futur A.S. Goudie and A.G. Parker: (e (Free	eman, 2008, 2nd ed.)	•	,
Additional Course Information	Previous course	code & title: EASC2131 A Co	ol Wor	ld: Ice Ages and Climate	Chang	е

EASC3408 Geophysics (6	creaits)	Academic Year					
Offering Department	Earth Sci	rth Sciences Quota					
Course Co-ordinator	Prof P P	C Wu, Earth Sciences (ppwu@hku.hk)					
Teachers Involved	Prof P P	C Wu, Earth Sciences					
Course Objectives	geophysi	iew of the geophysical characteristics and processes of the solid earth and a sucal disciplines, including seismology, gravity, geothermometry, geomagnetism and sexploration geophysical methods for studying the earth's interior and near subsu	d paleomagnetism				
Course Contents & Topics	- Seismic - Seismic - Gravity - Isostasy - Geoma - Paleom - Therma - Applied - Applied - Applied	Earthquake Seismology Seismic waves and free oscillations Seismicity Analysis Gravity and gravity anomalies sostasy and Geodesy Seomagnetism Paleomagnetism and rock magnetism Thermal Properties of the Earth Applied Geophysical Methods: Electrical methods Applied Geophysical Methods: seismic method Applied Geophysics: marine seismic Applied Geophysics: marine seismic Application of geophysics in HK In successful completion of this course, students should be able to:					
Course Learning Outcomes	On succe	essful completion of this course, students should be able to:					
	CLO 1	describe the approaches and methods geophysicists use to study the interior of the	ne earth				
	CLO 2 apply basic techniques in measurements of earthquakes and interpret a seismogram						
	CLO 3 describe the procedure to determine gravity anomalies and their interpretation						
	CLO 4	understand the methods of paleomagnetism and describe the processes of rock r	nagnetisation				
		understand the methods of paleomagnetism and describe the processes of rock r describe how density, pressure and temperature of the earth's interior are determ					
(and Co-requisites and Impermissible	CLO 5	, ,	ined				
(and Co-requisites and Impermissible combinations)	Pass in Introducte	describe how density, pressure and temperature of the earth's interior are determ EASC2401 Fluid/solid interactions in earth processes or EASC2402 Field methods.	ined				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016	CLO 5 Pass in Introducte	describe how density, pressure and temperature of the earth's interior are determ EASC2401 Fluid/solid interactions in earth processes or EASC2402 Field methory mechanics	nods or PHYS2250				
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in Introductor	describe how density, pressure and temperature of the earth's interior are determ EASC2401 Fluid/solid interactions in earth processes or EASC2402 Field methory mechanics	nods or PHYS2250				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in Introducte Y 2n Y	describe how density, pressure and temperature of the earth's interior are determ EASC2401 Fluid/solid interactions in earth processes or EASC2402 Field methory mechanics	nods or PHYS2250 May May				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in Introductor Y 2n Y A+ to F	describe how density, pressure and temperature of the earth's interior are determ EASC2401 Fluid/solid interactions in earth processes or EASC2402 Field methory mechanics d sem Examination Demonstrated an in-depth understanding of the subject well above the expected level of an urand achieving over 80% of total marks and an ability to pursue advance-level study in so	May May hiversity undergraduate me of the geophysics diachieving 70% of the				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017	Pass in Introductor Y 2n Y A+ to F	describe how density, pressure and temperature of the earth's interior are determ EASC2401 Fluid/solid interactions in earth processes or EASC2402 Field methory mechanics d sem Examination Demonstrated an in-depth understanding of the subject well above the expected level of an urand achieving over 80% of total marks and an ability to pursue advance-level study in so subdisciplines. Demonstrate an understanding of the subject at the appropriate level of a university student and total course marks. A greater effort and further preparation are needed if student plans to preparation plans to preparation are needed if student plans to preparation plans to prepa	May May May May May May May May				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in Introductor Y 2n Y A+ to F B	Demonstrated an in-depth understanding of the subject well above the expected level of an urand achieving over 80% of total marks and an ability to pursue advance-level study in so subdisciplines. Demonstrate an understanding of the subject at the appropriate level of a university student and total course marks. A greater effort and further preparation are needed if student plans to prepare to prepare to the subject and the subject and the subject without in-depth analysis. Achieved 60-70% of total course marks. Demonstrated an insufficient understanding of the subject as total course mark achieved is below is reflective only of the time the student puts in on the subject.	May May May May May May May May				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in Introductor Y 2n Y A+ to F B C	describe how density, pressure and temperature of the earth's interior are determ EASC2401 Fluid/solid interactions in earth processes or EASC2402 Field methory mechanics d sem Examination Demonstrated an in-depth understanding of the subject well above the expected level of an urand achieving over 80% of total marks and an ability to pursue advance-level study in so subdisciplines. Demonstrate an understanding of the subject at the appropriate level of a university student antotal course marks. A greater effort and further preparation are needed if student plans to peophysics. Coursework and examination results reflect only only a basic understanding of the subject without in-depth analysis. Achieved 60-70% of total course marks. Demonstrated an insufficient understanding of the subject as total course mark achieved is below	May May May May May May May May				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	Pass in Introductor Y 2n Y A+ to F A B C D Fail	describe how density, pressure and temperature of the earth's interior are determ EASC2401 Fluid/solid interactions in earth processes or EASC2402 Field methory mechanics d sem Examination Demonstrated an in-depth understanding of the subject well above the expected level of an urand achieving over 80% of total marks and an ability to pursue advance-level study in so subdisciplines. Demonstrate an understanding of the subject at the appropriate level of a university student and total course marks. A greater effort and further preparation are needed if student plans to peophysics. Coursework and examination results reflect only only a basic understanding of the subject without in-depth analysis. Achieved 60-70% of total course marks. Demonstrated an insufficient understanding of the subject as total course mark achieved is below is reflective only of the time the student puts in on the subject. A total lack of effort and insufficient ability to understand the subject and failure to achieve 50%	May May May May May May May May				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	Pass in Introductor Y 2n Y A+ to F A B C D Fail	describe how density, pressure and temperature of the earth's interior are determ EASC2401 Fluid/solid interactions in earth processes or EASC2402 Field methory mechanics d sem Examination Demonstrated an in-depth understanding of the subject well above the expected level of an urand achieving over 80% of total marks and an ability to pursue advance-level study in so subdisciplines. Demonstrate an understanding of the subject at the appropriate level of a university student antotal course marks. A greater effort and further preparation are needed if student plans to peophysics. Coursework and examination results reflect only only a basic understanding of the subject without in-depth analysis. Achieved 60-70% of total course marks. Demonstrated an insufficient understanding of the subject as total course mark achieved is below is reflective only of the time the student puts in on the subject. A total lack of effort and insufficient ability to understand the subject and failure to achieve 50% marks. with laboratory component course	May May May May May May May May				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	Pass in Introductor Y 2n Y A+ to F B C D Fail	describe how density, pressure and temperature of the earth's interior are determ EASC2401 Fluid/solid interactions in earth processes or EASC2402 Field methory mechanics d sem Examination Demonstrated an in-depth understanding of the subject well above the expected level of an urand achieving over 80% of total marks and an ability to pursue advance-level study in so subdisciplines. Demonstrate an understanding of the subject at the appropriate level of a university student and total course marks. A greater effort and further preparation are needed if student plans to prepare to the subject and examination results reflect only only a basic understanding of the subject without in-depth analysis. Achieved 60-70% of total course marks. Demonstrated an insufficient understanding of the subject as total course mark achieved is below is reflective only of the time the student puts in on the subject. A total lack of effort and insufficient ability to understand the subject and failure to achieve 50% marks. With laboratory component course Details	May May May May May May May May				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in Introductor Y 2n Y A+ to F A B C D Fail Lecture v	Demonstrated an in-depth understanding of the subject well above the expected level of an ur and achieving over 80% of total marks and an ability to pursue advance-level study in so subdisciplines. Demonstrate an understanding of the subject at the appropriate level of a university student and total course marks. A greater effort and further preparation are needed if student plans to peophysics. Coursework and examination results reflect only only a basic understanding of the subject without in-depth analysis. Achieved 60-70% of total course marks. Demonstrated an insufficient understanding of the subject as total course mark achieved is below is reflective only of the time the student puts in on the subject. A total lack of effort and insufficient ability to understand the subject and failure to achieve 50% marks. Vith laboratory component course Be paper exercises, 2 field	May May May May May May May May				

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		40	CLO 1,2,3,4,5

EASC3409 Igneous and m			ogenesis (o credits)		Academic Year	2015		
Offering Department	Earth Sci	Earth Sciences Prof M Sun, Earth Sciences (minsun@hku.hk)						
Course Co-ordinator	Prof M S	n, Eart	h Sciences (minsun@hku.hk)					
Teachers Involved			h Sciences rth Sciences					
Course Objectives			nprehensive coverage of the ptamorphic rocks and their cau					
Course Contents & Topics	- Basaltic - Granitic - Magmar - Magmar - Types c - Chemic etc) - Metamo - Metamo - Metamo - Metamo	 Application of trace elements and isotopes to the study of magma genesis Basaltic magmatism and mantle characteristics Granitic magma and crustal characteristics Magmatism at convergent boundaries Magmatism and crustal growth Types of metamorphism Chemical equilibrium/disequilibrium in metamorphism; metamorphic phase diagrams (ACF, A'KI 						
Course Learning Outcomes	On succe	ssful co	ompletion of this course, stude	nts should be able to	0:			
	CLO 2	CLO 2 use magmatic rocks to study the mantle and crustal characteristics						
		CLO 3 apply mineral assemblages, microtextures, mineral reaction relationships and metamorphic P-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)		ASC34	02 Petrology					
Offer in 2015 - 2016	Y 2n	sem			Examination	May		
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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.						
	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 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 learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability moderately effective lab skills and techniques to solve problems. Mostly correct but some erroneous use of d results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.						
	D	D Demonstrate partial but limited command of outcomes. Show evidence of some coherer limited ability to apply partially effective lab			l of knowledge and skills required for attaining some of the course learnin rent and logical thinking, but with limited analytical and critical abilities, an ab skills and techniques to solve problems. Limited ability to use data an apply limited or barely effective organizational and presentational skills.			
	Fail	Fail Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical ability or ineffective lab skills and techniques to			ommand of knowledge and skills required for attaining the course learning abilities, logical and coherent thinking, and ability to apply minimally effective to solve problems. Misuse of data and results and/or unable to drain dresentational skills are minimally effective or ineffective.			
Course Type	Lecture v	ith labo	oratory component course					
Course Teaching	Activitie	s		Details		No. of Hours		
& Learning Activities	Lectures					24		
	Laborato	ry				24		
		•	tudy			100		
		Reading / Self study						

	Assignments	50	CLO 1,2,3,4
	Examination	50	CLO 1,2,3,4
Required/recommended reading and online materials	M.G. Best: Igneous and Metamorphic Petrology (Oxfo	ord Blackwell Science, 2	003, 2nd ed.)
Additional Course Information	John D Winter: An Introduction to Igneous and Metam	norphic Petrology (Prent	ice Hall, 2001)

EASC3410 Hydrogeology (o or carro,				mic Year			
Offering Department	Earth Scie	nces		Quota		40		
Course Co-ordinator	Prof J J Jia	ao, Earth Sciences <i>(jjiao</i> @hi	ku.hk)					
Teachers Involved	Prof J J Jia	ao, Earth Sciences						
Course Objectives	to case stu hydraulics	This course aims to introduce some basic concepts and theories of groundwater flow with special reference to case studies in HK. It consists of three components: 1) fundamentals of groundwater physics; 2) we hydraulics and evaluation of groundwater as a resource; and 3) influence of groundwater on geotechnical and environmental engineering						
Course Contents & Topics	Properties Hydraulic I Basic Equa Groundwa Analysis O Well install Regional G	rdrologic Cycle And water Budgets, Introduction to Hydrogeology (1 Week) operties Of Aquifers (2 Weeks) rdraulic head and flow net(2 Weeks) usic Equations of Groundwater Flow (1 Week) oundwater Flow To Wells (1 Week) ralysis Of Aquifer Test(2 Weeks) ell installation & pumping test design(1 Week) regional Groundwater Flow Systems (HK case study)(1 Week) oundwater contamination (China case study)(Week 12)						
Course Learning Outcomes	On succes	sful completion of this cours	e, students sh	ould be able to:				
	CLO 1 a	CLO 1 appreciate the importance of hydrogeology in geotechnical and environmental engineering						
		nderstand basic concepts or roundwater and surface water	cycle and water baland	ce, and inte	raction between			
	CLO 3 ap	CLO 3 appreciate the close relationship between groundwater syste				stem and geology and topography		
		CLO 4 understand basic concepts of aquifer and aquifer properties, hydraulic head, flow net, and bas principles of groundwater flow						
	CLO 5 us	se basic field aquifer tests to	estimate som	e important aquifer paran	neters			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in EA	Pass in EASC2402 Field methods						
Offer in 2015 - 2016	Y 1st s	sem		Exami	nation	Dec		
Offer in 2016 - 2017	Υ			'		'		
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough 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 thought, and ability to apply knowledge to a wide range of complex practical problems. Apply highly organizational and presentational skills.						
	В	B Demonstrate substantial command of a broad range of knowledge a course learning outcomes. Show evidence of analytical and critical knowledge to most practical problems. Apply effective organizational				d critical abilities and logical thinking, and ability to apply		
	С							
	D	Demonstrate partial but limited of outcomes. Show evidence of soi limited ability to apply knowledge presentational skills.	ogical thinking, but with limited	analytical and o	ritical abilities. Show			
	Fail	Demonstrate little or no eviden outcomes. Lack of analytical anknowledge to solve practical pro	logical and coherent thinking. S	how very little	or no ability to apply			
Course Type	Lecture wit	th laboratory component cou	ırse					
Course Teaching	Activities	.	De	etails		No. of Hours		
& Learning Activities	Lectures		12	2 sessions x 2 hours		24		
	Laboratory			x 2 hours		20		
	Field work	<	alf day field trip		5			
	Reading /	Self study				100		
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)		sment Methods o CLO Mapping		
	Assignme	ents		30	CLO	1,2,3,4		
		camination						

Required/recommended reading and online materials

C. W. Fetter: Applied Hydrogeology (Pearson Education Limited, 2014, 4th ed.)

EASC3412 Earth resource	es (6 credit	S)			Academic `	rear	2015		
Offering Department	Earth Sci	ences			Quota		40		
Course Co-ordinator	Prof M F	rof M F Zhou, Earth Sciences (mfzhou@hku.hk)							
Teachers Involved		Prof M F Zhou, Earth Sciences Prof G Zhao, Earth Sciences							
Course Objectives	understar	o provide students with knowledge about the classification of mineral deposits and their basic features; to derstand the processes that lead to their formation; to gain hand on experience with mining procedure; addition, students should gain knowledge about the world wide distributions of mineral and industrictsources.							
Course Contents & Topics	mineral c	cepts in mineral deposits and mining industrial; exploration and mining methods, classificatio eral deposit, mineral deposit models, magmatic oxide and sulfide deposits, skarn deposits, porp osits, volcanogenic massive sulfide deposits, coal, oil and gas, resource evaluation.							
Course Learning Outcomes	On succe	successful completion of this course, students should be able to:							
	CLO 1	understand	the terminology and nomen	clature in the mining	g industrial and	minera	l deposits		
	CLO 2	understand	factors that are key to the fo	rmation of metallic	and industrial r	esource	es		
	CLO 3	understand	the controls of earth resourc	es in a global scale)				
	CLO 4	understand	methods of exploration and	exploitation for min	eral deposits				
Pre-requisites (and Co-requisites and Impermissible combinations)		ASC2402 F	ield methods or EASC3402	Petrology					
Offer in 2015 - 2016	Y 1st	t sem			Examination	n	Dec		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	A Demonstrate thorough understanding at an advanced level of extensive knowledge and skills with evidence fo 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	B Demonstrate substantial understanding at an advanced level of extensive knowledge and skills with evidence for attaining all the course learning outcomes. Show analytical and critical abilities and logical thinking. Evidence original thoughts and abilities of field observation. Effective organization and presentation skills.							
	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.							
	D	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								
Course Type	Lecture w	vith laborator	y component course						
Course Teaching	Activitie	es		Details			No. of Hours		
& Learning Activities	Lectures	.		2 hour lectures p	per week for 1	0	20		
	Laborato	ory					20		
	Field wo	rk		1 overseas camp			40		
	Reading	/ Self study					100		
Assessment Methods and Weighting	Methods	s	Details		ng in final grade (%)		ment Method CLO Mappin		
	Assignm	ents	Oversea field trip		20	CL	O 1,2,4		
	Examina	ation			60	CLC	O 1,2,3,4		
	Laborato	ory reports			20	С	LO 1,2		
Required/recommended reading and online materials	TBC								

EASC3413 Engineering	geology (6 credits)	Academic Year	2015
Offering Department	Quota	40	
Course Co-ordinator	Prof J J Jiao, Earth Sciences (jjiao@hku.hk)		
Teachers Involved			

Required/recommended	Goodmai	n, R. E.:	Engineering Geology (Wiley	, 1993).				
	Examina	ation				70	CLO 1,2	,3,4,5
and Weighting	Method		Details including field report		Weighting in fi course grade			ent Methods CLO Mapping 3,4,5
Assessment Methods	Reading				Woighting in fi	inal A		90
	Field wo		andy.	ha	If day field trip			5
	Laborato				K -1 #:-1 ! ! !			20
	Lectures							24
Course Teaching & Learning Activities	Activitie			De	etails			No. of Hours
Course Type Course Teaching			ratory component course					
Course Type	Lecture	ineffe	ctive.	olems. Or	ganization and prese	ntational skills a	are minim	ally effective or
	roganizational 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 and skills to practical problems. Organization and presentational skills are minimally effective or							
	D							al abilities. Show
	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 and skills to solve most familiar, but not unfamiliar, practical problems. Apply moderately effective organizational and presentational skills.							
Grade Descriptors	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 and skills to solve familiar and some unfamiliar practical problems. Apply effective organizational and presentational skills.						
	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 and skills to solve a wide range of complex, familiar and unfamiliar practical problems. Apply highly effective organizational and presentational skills.							
Course Grade	A+ to F							
Offer in 2016 - 2017	Υ							
Offer in 2015 - 2016	Y 2n	d sem				Examination		Мау
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in students	Pass in EASC3410 Hydrogeology, or already enrolled in this course. This course is only for final year students						
			ut stability analyses using in method	method	s such as the lir	mit equilibriu	m and	stereographic
			and major types of slope failu		I basic methods to	control and n	nitigate I	andslides
	CLO 3 carry out simple air photo interpretation tasks and elementary soil and rock description and classification for engineering purposes							
	CLO 2 make simple engineering-geological models and understand how desk study, site reconnaissance survey and ground investigation design should be carried out							
	CLO 1 appreciate how civil engineering design is carried out and understand the work of the geologist on engineering projects, particularly the economic- and safety-critical duties							
Course Learning Outcomes	On succe	essful co	mpletion of this course, stud	ents sho	ould be able to:			
Course Contents & Topics	and skills	Introduction to engineering design and the role of the Engineering Geologist; site investigation concepts and skills (air photo interpretation, soil and rock description, engineering geological plans, reporting) slopes, foundations. Case histories from Hong Kong.						
Course Objectives		To present some of the concepts and skills of importance in the profession of Engineering Geology and illustrate their use by case histories.						
	Prof J J Jiao, Earth Sciences Prof A Malone, Earth Sciences							

EASC3414 Soil and rock i	nechanics (6 credits)	Academic Year	2015
Offering Department	Earth Sciences	Quota	40
Course Co-ordinator	Prof J J Jiao, Earth Sciences (jjiao@hku.hk)		
Teachers Involved	Prof J J Jiao, Earth Sciences TBC, TBC		
Course Objectives	To provide a basic knowledge of soil and rock mechanics f career in engineering geology/geotechnics.	or those wishing to consider for	ırther studies on
Course Contents & Topics			

	stress; stre	Stress and strain; properties and classifications of soil and rock; clay minerals; pore pressure stress; strength and failure criteria, initial stresses and their measurement; deformation; planes of weakness in rocks; ground treatment methods.							
Course Learning Outcomes	On successful completion of this course, students should be able to:								
		CLO 1 understand basic concepts of stress and strain, pore pressure and effective stress, strength and failure criteria							
	CLO 2 understand basic properties and classifications of soil and rock								
	CLO 3 app	oreciate the proc	ess of rock deformat	tion an	d soil consolidation	n			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in EAS	Pass in EASC3410 Hydrogeology, or already enrolled in this course							
Offer in 2015 - 2016	Y 2nd s	em			Ex	camination	May		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required course learning outcomes. Show strong analytical and critical abilities and logical thinking. As organizational and presentational skills.							
	В	course learning ou	antial command of a broat tcomes. Show evidence presentational skills.						
	С	C Demonstrate general but incomplete command of knowledge and skills required for attaining mo learning outcomes. Show evidence of some analytical and critical abilities and logical thinking. A effective organizational and presentational skills.							
	D	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learnin outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Appl 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. Organization and presentational skills are minimally effective or ineffective.								
Course Type	Lecture with	laboratory com	ponent course						
Course Teaching	Activities			Deta	ails		No. of Hours		
& Learning Activities	Lectures						24		
	Laboratory						24		
	Reading / S	Self study					100		
Assessment Methods and Weighting	Methods	Details			Weighting in fin course grade (%		sessment Methods to CLO Mapping		
	Assignmen	ts			3	30 (CLO 1,2,3		
	Examination	n			7	70 (CLO 1,2,3		
Required/recommended reading and online materials			(Chapman & Hall, 6t n to Rock Mechanics		Wiley & Sons, 198	39)			

EASC3415 Meteorology (6	credits)				Academic Year	2015	
Offering Department	Earth Sci	Earth Sciences Quota					
Course Co-ordinator	Dr Z H Li	Liu, E	rth Sciences (zhliu@hku.hk)				
Teachers Involved			orth Sciences Farth Sciences				
Course Objectives			rovides students with a modern unde that govern atmospheric structure an				
Course Contents & Topics	state and	ind pi	t, radiative forcing, and greenhouse ssure; thermodynamic diagrams; w r masses, and fronts; thunderstorn ne atmosphere; weather forecasting.	eather charts; Ford	ces, winds, and ge	neral circulation	
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1 describe key aspects of weather phenomena						
	CLO 2 explain essential elements of atmospheric processes governing weather						
	CLO 3	3 ap	ly physical principles to construct mo	dels for some basic	aspects of weather		
	CLO 4	ex	lain synoptic charts (weather maps)				
	CLO 5	int	rpret Hong Kong weather (typhoons	etc.)			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in E	n EAS	2404 Introduction to atmosphere and	d hydrosphere			

Offer in 2015 - 2016	Y 1st sem		Exami	nation	Dec			
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	cou tho criti	monstrate thorough mastery at an advance rise learning outcomes. Show strong and ught, and ability to apply knowledge to a cal use of data and results to draw applysis / evaluation of information drawn from	lytical and critical abilities and logica wide range of complex, familiar and opropriate and insightful conclusions	l thinking, with unfamiliar site . Show insigl	n evidence of original uations. Demonstrate htful use and critical			
	cou kno app	monstrate substantial command of a broat rse learning outcomes. Show evidence of wledge to familiar and some unfamiliar ropriate conclusions. Show critical use sparisons between different secondary int	of analytical and critical abilities and lar situations. Demonstrate correct of relevant information from source	logical thinking use of data es and ability	g, and ability to apply and results to draw			
	lea kno dra	nonstrate general but incomplete commining outcomes. Show evidence of some wledge to most familiar situations. Dem w appropriate conclusions. Show use o ween different interpretations and to quote	analytical and critical abilities and leads to strate mostly correct but some error frelevant information from sources	ogical thinking oneous use o	, and ability to apply of data and results to			
	out limi app	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.						
	out	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learnin outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to appl knowledge to solve problems. Demonstrate misuse of data and results and/or unable to draw appropriat conclusions. Show limited use of secondary sources and no critical comparison of them.						
Course Type	Lecture-based	course						
Course Teaching	Activities		Details		No. of Hours			
& Learning Activities	Lectures				36			
	Project work				36			
	Tutorials				12			
	Reading / Self	study			48			
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)		ssment Methods to CLO Mapping			
	Assignments		25	CLO 1,2,3				
	Examination	2-hour written exam	50					
	Project report		25	CL	O 1,4,5			
Required/recommended reading and online materials	(Brooks/Cole, 2	rens, Meteorology Today, An 013). Meteorology for Scientists and E	•		the Environmen			

EASC3416 Advanced geoc	hemistr	and geochronology (6 credits)	Academic Year	2015				
Offering Department	Earth S	arth Sciences Quota 50						
Course Co-ordinator	Prof M	of M F Zhou, Earth Sciences (mfzhou@hku.hk)						
Teachers Involved	Dr S H	Thou, Earth Sciences i, Earth Sciences sun, Earth Sciences						
Course Objectives		present key concepts of modern geochemistry and geochronology and their application to vironmental and Earth science problems.						
Course Contents & Topics	2. Zirco 3. Princ 4. Introd	ples of radiogenic isotopic dating and modern inst n U-Pb isotopic dating and its application ples and techniques for dating mineral deposits uction to Quaternary geochronology ple, development and applications of Luminescen						
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	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 appliand Earth sciences	ed to gain insight into process i	n environmental				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Mineral	EASC2401 Fluid/solid interactions in earth proce	sses or EASC2406 Geochemis	try or EASC240				
Offer in 2015 - 2016	N		Examination					
Offer in 2016 - 2017	Υ		,					
Course Grade	A+ to F							

Grade Descriptors	all original san	dent demonstrates thorough mastery at course learning outcomes. Shows stro- inal thought, and the ability to apply his he, can combine fundamental knowled, gases and how these processes impa- dent shows the ability to apply highly eff	ng analy s/her kno ge in geo ct fluxes	tical and critical abilities and wedge to a wide range of probehemistry to understand the in of materials over geological tin	logical thinking, with evidence of plems in geochemistry, and at the iteractions among minerals, fluids ne periods and on a global scale.					
	mos app geo	B Student demonstrates 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 apply his/her knowledge to a range of problems in geochemistry, and at the same combine knowledge in geochemistry to understand material fluxes among minerals, fluids and gases over geological time periods and on a global scale. Student shows the ability to apply effective organizational and presentational skills.								
	cou app gas	C 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.								
	lear abil kno	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 Student demonstrates 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. Shows very little or no ability to apply knowledge to understand basic topics related to the geochemistry and the application of these principles to geological problems. Organization and presentational skills are minimally effective or ineffective.									
Course Type	Lecture with lab	oratory component course								
Course Teaching	Activities		Det	ails	No. of Hours					
& Learning Activities	Lectures				24					
	Laboratory		Up	to 24 hours	24					
	Group work				24					
	Discussion		Up	24						
	Reading / Self	study			60					
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping					
	Examination	One 2-hour written examina	ition	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	Geochemistry b	y William M. White (Wuley, Apr	1, 2013	3)						

EASC3999 Directed studi	ies in ea	arth sc	iences (6 credits	5)		Academic Year	2015			
Offering Department	Earth Sc	rth Sciences Quota								
Course Co-ordinator	Prof M S	Sun, Ea	rth Sciences (minsu	n @hku.hk)			·			
Teachers Involved	Various	ous teachers in the Department, Earth Sciences								
Course Objectives	To enha thinking		e student's knowled	ge of a particular to	opic and the stud	ent's self-directed le	arning and critica			
Course Contents & Topics	member.	student undertakes a self-managed study on a topic in earth sciences under the supervision of a st iber. The topic is preferably one not sufficiently covered in the regular curriculum. The directed study c critical review or a synthesis of published work on the subject, or a laboratory or field study that work once the student's understanding of the subject. The project may not require an element of originality.								
Course Learning Outcomes	On successful completion of this course, students should be able to:									
	CLO 1 enhance the ability in self-learning, data-collection and analysis, critical thinking, doing independent research in earth sciences									
	CLO 2	2 write s	cientific dissertation	, and conduct oral լ	presentation of the	e research results				
Pre-requisites (and Co-requisites and Impermissible combinations)	Earth Sy Cumulat This cou of the Ea	System S ative GP. ourse is i Earth Sys	Science Majors; and A of 2.5 or above.	se and students ca	annot use this cou	ore/elective courses urse to fulfill the cap tudy.	0.			
Offer in 2015 - 2016	Y Ye	Year long	g			Examination	No Exam			
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F	•								
Grade Descriptors	A	A Demonstrate thorough grasp of the subject. Show strong analytical and critical abilities and logical evidence of original thought. Insightful use and critical analysis / evaluation of information drawn from a foundarily sources and to quote/reference aptly. Critical use of data and results to draw insightful concluperoblems. Apply highly effective organizational and presentational skills. [Work of A+ should show consist thinking and additional work beyond that is required in wider areas relevant to the topic.]								

	of rele	B Demonstrate substantial grasp of the subject. Evidence of analytical and critical abilities and logical thinking. Cri of relevant information from sources, showing ability to make meaningful comparisons between different se interpretations and to quote/reference aptly. Correct use of data of results to draw appropriate conclusions insightful conclusions and solve problems. Apply effective organizational and presentational skills.						
	thinking and to	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. 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. Apply limited or barely effective organizational and presentational skills.						
	cohere							
	analytic of then	strate evidence of little or no grasp of the cal and critical abilities, logical and cohere n. Misuse of data and results and/or un e minimally effective or ineffective.	ent thinking. Limited use of secondary s	ources and no critical comparison				
Course Type	Project-based cou	rse						
Course Teaching	Activities		Details	No. of Hours				
& Learning Activities	Reading / Self stu	ndy	The student is expected to s at least 120 hours on the pro					
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 Biogeochemical	l cycles (6 credits)	Academic Year	2015					
Offering Department	Earth Sc	ences	Quota						
Course Co-ordinator	Dr Y Li, E	Earth Sciences (yiliang@hku.hk)							
Teachers Involved	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 o 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	2) Geobi 3) Terres 4) Aquati 5) Marine 6) Phosp 7) Sulfur 8) Carbo 9) Nitrog	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 Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 describe the major geochemical cycles on Earth								
	CLO 2 illustrate the interactions between the geochemical cycles and the main environments on Earth								
	CLO 3 draw connections between changes to the Earth systems and the cause/effect relationships of changes to biogeochemical cycles								
	CLO 4 knows why the anthropogenic activities become a significant part of globe change								
Pre-requisites (and Co-requisites and Impermissible combinations)		ENVS3313 Environmental oceanography or EASC3403 d geochemistry and geochronology	Sedimentary environmen	nts or EASC3416					
Offer in 2015 - 2016	Y 1s	t sem	Examination	Dec					
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for atta course learning outcomes. Show strong analytical and critical activities and logical thinking.							
	В	Demonstrate substantial command of a broad range of knowledge course learning outcome. Show evidence of analytical and critical		g at least most of the					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the collearning outcomes. Apply moderately effective organizational and presentational skills. Show interest in the tropics, and to answer most questions correctly.								
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learnin outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Sh 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 evidence of command of knowledge a outcomes. Lack of analytical and critical abilities, logical and coh knowledge to solve problems. Does not show positive attitude in le	erent thinking. Show very little	or no ability to apply					
	_	· ·							

Course Teaching & Learning Activities	Activities		De	etails	No. of Hours	
a Learning Activities	Lectures				28	
	Tutorials				10	
	Field work				8	
	Group work	Group work		BL group work	10	
	Project work	Project work		riting 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	
	Examination			40	CLO 1,2,3,4	
Required/recommended reading and online materials		stry: An Analysis of Glo o marine biogeochemis		Villiam H. Schlesinger, Em Libes, Elsevier, 2009.	nily Bernhardt.	

EASC4406 Earth dynamics	o a gioba			2015					
Offering Department	Earth So	ciences	Quota						
Course Co-ordinator	Prof G Z	hao, Earth Sciences (gzhao@hku.hk)							
Teachers Involved		Prof G Zhao, Earth Sciences Prof P P C Wu, Earth Sciences							
Course Objectives	This cou	To review the concepts and processes that shape the configuration of the Earth, from core to crust. This course is intended to provide students with an understanding of the driving forces of Earth processe and the global outcome of these processes through an examination of direct and indirect observations, the evolution of hypotheses, and critical thinking.							
Course Contents & Topics	- Earth as a heat engine; Earth's interior; major features of the continents and oceans; - Plate tectonics; orogenesis; crustal growth Mantle convection; hot spots and plumes; - Energy and driving forces of Earth processes; - Methods of investigation of large scale structures and processes; - Structure and physical properties of the planet; - Isostasy; continental drift; - Sea floor spreading; ocean ridges; transform faults; - Subduction zones; mountain belts and orogenesis; - Formation of continental crust; - Continental rifts and continental margins; - Sedimentary basins; - Mechanism, consequence and implication of plate tectonics.								
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1	CLO 1 have an appreciation of the Earth as a dynamic planet							
	CLO 2	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 processes								
	CLO 4 distill of a wide range of data to differentiate competing geological theories								
	CLO 5	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)		EASC3403 Sedimentary environments or EASC3404 Str 3409 Igneous and metamorphic petrogenesis	uctural geology or EASC	3408 Geophysic					
Offer in 2015 - 2016	Y 2	nd sem	Examination	May					
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	The student should show a thorough mastery of the knowledge and skills necessary to attain all of the outcomes, have an in-depth grasp of the subject, and provide evidence of strong analytical and logical twhere possible with original thought. Show outstanding and effective organizational and presentation skills, insightful use of data, literature reviews and other sources to undertake a high level of critical analysis at appropriate conclusions. Be able to integrate the full range of appropriate theories, principles, and evidence.							
	B The student should show a substantial knowledge of a significant range of the skills necessary for attaining mot all, of the course outcomes, and have a substantial grasp of the subject. Show evidence of the ability to critically and to have effective organizational and presentational skills and make critical use of relevant inform from different sources, showing the ability to make comparisons between consequent interpretations. Be capathe general integration of theories, principles and evidence.								
	С	the general integration of theories, principles and evidence. The student should have a general command of the knowledge, competencies and skills required for attaining th majority of the course outcomes, and a general grasp of the subject. Show some evidence of critical ability an logical thinking and moderately effective organizational and presentational skills. The student should be moderatel effective in the use of data to draw appropriate conclusions, should be able to use relevant information from source and able to make comparisons between different interpretations, through partial integration of theories, principles an							

	atta ana Hav	The student should have a partial but limited command of the knowledge, competencies and skills necessary attaining a number of the course learning outcomes, and a limited grasp of the subject. Show evidence of st analytical competence and critical thinking and at least marginally effective organizational and presentational sl Have limited ability to use data and results to draw appropriate conclusions and use and reference a variet sources mainly in summary rather than through analysis and comparison.					
	lear abili	The student shows little or no evidence of knowledge and skills required for attaining even the minority of or learning outcomes, lacks an overall grasp of the subject area and shows an absence of analytical and critical this abilities. Shows little ability to a apply knowledge to solve problems and has poor and ineffective presentation a organizational skills. Shows little evidence of the integration of theories, principles and evidence.					
Course Type	Lecture-based	course					
Course Teaching & Learning Activities	Activities	Activities				No. of Hours	
	Lectures					36	
	Tutorials			student seminars and exercises		12	
	Reading / Self study		essay, presentation plus additional reading		100		
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	As	ssessment Methods to CLO Mapping	
	Assignments			20	C	CLO 1,2,3,4,5	
	Essay	Including essays and seminars		s 50		CLO 1,2,3,4,5	
	Examination	1		30		CLO 1,2,3,4,5	
Required/recommended reading and online materials	Turcotte, D and	/ine, F.J. Global tectonics (Oxfor Schubert, G. Geodynamics (Car y F., Mantle convection for geolo	nbrid	lge Univ Press, 2002, 2r			

EASC4407 Regional geol	ogy (6 cr	edits)	Academic Year	2015				
Offering Department	Earth Sci	ences	Quota	40				
Course Co-ordinator	Dr J R Al	, Earth Sciences (jrali@hku.hk)						
Teachers Involved		, Earth Sciences nao, Earth Sciences						
Course Objectives		ine the key events and phenomena associated with that of Hong Kong.	e tectonic evolution of Eas	t-SE-South Asia				
Course Contents & Topics	Geology India-Asia Formatio mantle p Neoprote	Introduction; Tools; China assembly; China origins; Emeishan LIP, SW China; Mesozoic South China Geology of HK: igneous; HK seds; deep structure; upper-level structure; Philippine Sea Plate-Taiwan; Tibet andia-Asia collision SE Asia (Java orogen, Sumatra orogen, Banda Sea, Molucca Sea, South China Sea) formation and evolution of Archean crust in the Eastern Block of the North China Craton: Plate tectonics vs nantle plumes; Paleoproterozoic amalgamation of the North China Craton; Late Mesoproterozoic to early deoproterozoic igneous events in the Yangtze Block: review of recently proposed models; Supercontinents from Columbia, through Rodinia, to Pangea: records in Chinese blocks.						
Course Learning Outcomes	On succe	ssful completion of this course, students should be able	to:					
		CLO 1 have an appreciation of the various "tools" that are a commonly used by earth scientists to decipher the evolution of a tectonically complicated region						
	CLO 2 have an awareness of the influential (and in some cases conflicting) models that have been proposed to explain how the collage of crustal elements that comprises East-SE-South Asia has been assembled over the last 250 million years, and where the "pieces" may have originated							
	CLO 3 carry out an in-depth scientific review (in this case a key geological issue associated with the region) of the literature (particularly hot-of-the-press journal papers and/or chapters in monographs) and to present the findings both orally at a seminar, and as an academic paper							
Pre-requisites (and Co-requisites and Impermissible combinations)		EASC3403 Sedimentary environments or EASC3404 Stobic petrogenesis	tructural geology or EASC3	409 Igneous an				
Offer in 2015 - 2016	Y 1s	sem	Examination	Dec				
Offer in 2016 - 2017	Υ		'					
Course Grade	A+ to F							
Grade Descriptors	A 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 aptly.							
	B Substantial grasp of the subject; evidence of critical abilities and logical thinking; 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	General but incomplete grasp of the subject; evidence of some critical abilities and logical thinking; 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	Limited grasp of the subject, retention of some relevant informat limited or barely effective organizational and presentational skil through summary rather than analysis and comparison.						
	Fail	Little or no grasp of the knowledge and understanding of the subj coherent thinking; incoherent organization and poor presentational comparison of them.						

Course Type	Lecture with labo	Lecture with laboratory component course						
Course Teaching & Learning Activities	Activities	Activities		Details	No. of Hours			
& Learning Activities	Lectures				28			
	Laboratory	Laboratory		uided literature surveys	20			
	Reading / Self st	tudy			80			
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments			50	CLO 3			
	Examination			50	CLO 1,2			

EASC4408 Special topics	in earth scienc	es (6 credits)		Academic Year	2015					
Offering Department	Earth Sciences			Quota						
Course Co-ordinator	TBC, Earth Sci	BC, Earth Sciences ()								
Teachers Involved	TBC, Earth Sci	BC, Earth Sciences								
Course Objectives	TBC	TBC								
Course Contents & Topics	TBC	TBC								
Course Learning Outcomes	On successful	On successful completion of this course, students should be able to:								
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in any EA	SC3XXX or EAS	C4XXX course							
Offer in 2015 - 2016	N	N Examination								
Offer in 2016 - 2017	Υ	Υ								
Course Grade	A+ to F									
Grade Descriptors	A									
	В									
	С									
	D									
	Fail									
Course Type	Lecture with lat	ooratory compone	ent course							
Course Teaching & Learning Activities	Activities		Details	No. o						
Assessment Methods and Weighting	Methods	Details			Assessment Methods to CLO Mapping					
Required/recommended reading and online materials	ТВА									

EASC4911 Earth system: 0	contemporary issues (6 credits)	Academic Year	2015			
Offering Department	Earth Sciences	Quota				
Course Co-ordinator	Dr Y Li, Earth Sciences (yiliang@hku.hk)					
Teachers Involved	Dr Y Li, Earth Sciences 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	The Earth as an integrated system. The interactions between Earth's component parts. The evolution of Earth's global climates in deep time. The Earth as a fine-tuning system. Natural resource and managements. Natural hazards and managements. Bio-resources and Bioethics. Global trend in oil and natural gas. Global trend in mineral resources (non-metals, ferrous metals and rare earth elements).					
Course Learning Outcomes	On successful completion of this course, students should be able to:					
	CLO 1					

					editor, U. Aswathanaraya					
	Project	reports	Writing one course thesis		50	CL	O 1,3,4			
	Presentation		Present the course thesis to the class		30		O 1,2,3,4			
	Assignn	nents	A series of short essays on first half of teaching contents	the	20	CL	O 1,2,3,4			
Assessment Methods and Weighting	Method	ls	Details		Weighting in final course grade (%)		ssment Methods to CLO Mapping			
	Reading	Reading / Self study					50			
	Project	work					48			
	Tutorial	S					14			
& Learning Activities	Lecture	S					18			
Course Teaching	Activitie	es	-	Detai	tails No. o					
Course Type	Lecture-l	based cou	rse							
	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 synthesize and apply knowledge to solve problems. Demonstrate misuse of data, literature reviews, and other sources and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.								
	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 synthesize and apply knowledge to solve problems. Demonstrate limited ability to use of data, literature reviews, and other sources to draw appropriate conclusions. Apply limited or barely 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 synthesize and apply knowledge to most familiar situations. Demonstrate mostly correct but some erroneous use of data, literature reviews, and other sources to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.									
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and abilities synthesize and apply knowledge to familiar and some unfamiliar situations. Demonstrate correct use of literature reviews, and other sources to draw appropriate conclusions. Apply effective organizational presentational skills.								
Grade Descriptors	A									
Course Grade	A+ to F									
Offer in 2016 - 2017	Υ				ı					
mpermissible combinations) Offer in 2015 - 2016	This cap	EASC3415 Meteorology; ENVS3313 Environmental oceanography. 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 2nd sem Examination No Exam								
Pre-requisites (and Co-requisites and	Pass in System	at least 24 Science	4 credits of advanced level (leve Major including at least two	el 3 d of tl	or 4) disciplinary core/el the following courses:	ective cou				
		0.1	d how past and present activities			ıture				
		CLO 3 synthesize scientific data available from a variety of sources and apply the data to problem solving, particularly in areas of contemporary concern								
	CLO 2	understan	d the basis of interrelationships t	throu	gh feedback loops withi	the Eart	h System			
		System	and in some depth the nature of	uic i	issues confronting name	irinaria as	part of the Latti			

EASC4955 Integrated fie	ASC4955 Integrated field studies (6 credits)					
Offering Department	Earth Sciences Quota 36					
Course Co-ordinator	Dr J A King, Earth Sciences (jessking@hku.hk)					
Teachers Involved	Dr J A King, Earth Sciences Dr T P Y Tam, Earth Sciences Dr S W P Ng, Earth Sciences Dr K H Lemke, Earth Sciences					
Course Objectives	The aims of a geological field camp are to provide 1) essential training and experience in geological mapping techniques and 2) opportunities to study at first-hand areas of particular geological interest and importance of an overseas locality. The course requires integration of geological knowledge from multiple geological disciplines.					
Course Contents & Topics						

	Test	1 field test	10		CLO 1				
Assessment Methods and Weighting	Methods Report	Details 3 reports x 30% each	Weighting in final course grade (%)		Assessment Methods to CLO Mapping CLO 1				
	Reading / S	Self study			72				
	Field work		18 field days x 5 ho	ours/day	90				
•	Lectures		18 sessions x 1 ho	ur	18				
Course Teaching & Learning Activities	Activities		Details		No. of Hours				
Course Type	Field camps)							
_	analytical and critical abilities, logical and coherent thinking. Apply minimally effective or ineffective fieldwork skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.								
	coherent and logical thinking, but with limited analytical and critical abilities. Apply partially effective 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 of little or no grasp of the knowledge and understanding of the subject. Evidence of little or lack of								
	C Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and logical thinking. 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. Demonstrate partial but limited grasp, with retention of some relevant information, of the subject. Evidence of some								
	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.								
Grade Descriptors	A Demonstrate thorough grasp of the subject. Show strong analytical and critical abilities and logical thinking, with evidence of original thought. Apply highly fieldwork skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions. Apply highly effective organizational and presentational skills.								
Course Grade	A+ to F								
Offer in 2016 - 2017	Υ								
Offer in 2015 - 2016	Y 2nd s	em		Examination	No Exam				
Pre-requisites (and Co-requisites and Impermissible combinations)	Major. This environmen This capsto	is in at least 24 credits of advanced level (level 3 or 4) disciplinary core/elective courses in the Geology. This must include either a PASS in, or student must be already enrolled in EASC3403 Sediments ronments, EASC3404 Structural geology, EASC3409 Igneous and metamorphic petrogenesis. capstone course is for Geology Major students only. earliest that a student is allowed to take this capstone course is their year 3 study.							
	CLO 1 sy	synthesize geological information pertaining to an area and derive a model of tectonic evolution							
Course Learning Outcomes	On success	ful completion of this course, student	s should be able to:						
	Students wi	Il undertake field mapping of an area	in small groups.						
		Geological setting and stratigraphy, tectonic evolution structural geology, petrography and petrogenesis crocks and minerals, economic deposits and geomorphology of the area.							
	Students will visit an area of geological interest and will undertake independent and group mapping and problem solving exercises in the area. The scope of study includes:								

EASC4966 Earth sciences	interns	nip (6 credits)	Academic Year	2015			
Offering Department	Earth So	Earth Sciences Quota					
Course Co-ordinator	Dr X R Z	uo, Earth Sciences (xuranzuo@hku.hk)					
Teachers Involved	Dr X R Z	uo, Earth Sciences					
Course Objectives	major of knowled	his course aims to offer students the opportunities to gain work experience in the industry related to tall ajor of study. The workplace learning experience would be of great benefits to the students to apply the nowledge gained in the study to the real work environments. Students have to take on at least 160 hour ternship work either within the University or outside the University arranged by the School/Departments.					
Course Contents & Topics	or variou (2) Outs student member	In the university: The student will be supervised by a staff ments tasks as instructed by the Supervisor. It ide the university: The student will work in an external agent will be supervised under a staff member of the external agency of the Department/School of the student (the Internal Supervisor, will normally be instructed by the External Supervisor, visor.	ncy related to the may the External Superisor). The work to be	ajor of study. The ervisor) and a staf performed by the			
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1	gain at least 4 weeks of work experience in a geosciences-re	elated firm or the Gov	ernment			
	CLO 2	acquire an understanding and appreciation of the real work e	nvironment				
	CLO 3 have some experience with applying learned knowledge to solving real world problems						
Pre-requisites (and Co-requisites and Impermissible combinations)	Earth Sy	at least 24 credits of advanced level (level 3 or 4) disciplinary of stem Science Majors. rse is not a capstone course and students cannot use this co		0,			

		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 2015 - 2016	Y 2n	d sem	Summer		E	kamination	No Exam		
Offer in 2016 - 2017	Y						'		
Course Grade	Pass/Fai	Pass/Fail							
Grade Descriptors	Pass	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	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	Activitie	es		De	Details No. of Hour				
& Learning Activities	Internsh	ip 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	Method	S	Details		Weighting in fin		essment Methods to CLO Mapping		
	Written ı	report	written report, emp feedback and oral presenta	10	00 CLO 1,2,3				
Additional Course Information	contact the Enrolmer	ne Depar nt of this	e assessed on "Pass/Fail" battment to obtain the approval. course is not conducted vient Department/School office a	a the c	online course selec	tion system an	d should be made		

EASC4999 Earth science	s projec	t (12 credits)	Academic Year	2015			
Offering Department	Earth So	iences	Quota				
Course Co-ordinator	Prof M S	un, Earth Sciences (minsun@hku.hk)					
Teachers Involved	Various	teachers in the Department, Earth Sciences					
Course Objectives		ance the student's knowledge, ability and interest in advang the student with an opportunity to be engaged in an advance		Earth Sciences b			
Course Contents & Topics	member and des role in the	e student undertakes a research project in the form of a senior thesis under the supervision of a mber. The project could be based on a particular component of a staff member's research or one projection designed by the student. The student must involve in the project in a non-trivial manner, and play a in the project formulation, data collection and analysis, and presentation. The project should containent of originality.					
Course Learning Outcomes	On succ	essful completion of this course, students should be able to:					
	CLO 1	acquire first-hand research experience in earth sciences by independently under the supervision of a supervisor	/ doing an individual	research projec			
	CLO 2 select research topics, design research path, choose research technology, and more importantly use critical thinking						
	CLO 3 enhance the ability in doing independent earth/environmental research with field/laboratory components						
Pre-requisites (and Co-requisites and Impermissible combinations)	Earth Sy Cumulat This cou of the Ea	at least 24 credits of advanced level (level 3 or 4) disciplinary stem Science Majors; and ive GPA of 2.7 or above. Itse is not a capstone course and students cannot use this capt arth System Science and Geology Majors. Itse it hat a student is allowed to take this course is their year 3	ourse to fulfill the cap	0,			
Offer in 2015 - 2016	Y Y	ear long	Examination	No Exam			
Offer in 2016 - 2017	Υ						
	Y A+ to F						
Offer in 2016 - 2017 Course Grade Grade Descriptors	-	Demonstrate thorough grasp of the subject. Show strong analytical evidence of original thought. Insightful use and critical analysis / evaluat quality sources and to quote/reference aptly. Critical use of first-hand da solve problems. Apply highly effective organizational and presentation creative thinking and additional work beyond that is required in wider are	ion of information drawn fronta ta and results to draw insignal skills. [Work of A+ shou	om a full range of hig ghtful conclusions an			
Course Grade	A+ to F	evidence of original thought. Insightful use and critical analysis / evaluat quality sources and to quote/reference aptly. Critical use of first-hand da solve problems. Apply highly effective organizational and presentation.	ion of information drawn from the and results to draw insignal skills. [Work of A+ should be as relevant to the topic.] and critical abilities and crein ingful comparisons between the of results to draw appropriate of the appropriate of results to draw appropriate and results and	om a full range of hig ghtful conclusions an alld show considerable ative thinking. Critica en different secondar opriate conclusions to			

	coh	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.						
	ana	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 first-hand data and results and/or unable to draw appropriate conclusions. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Project-based of	course						
Course Teaching & Learning Activities	Activities		Details No. of H					
a Learning Activities	Reading / Self	study	The student is expected at least 240 hours on the					
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)		Assessment Methods to CLO Mapping			
	Dissertation	Dissertation and presentation	100		CLO 1,2,3			

ENVS1401 Introduction to		,						
Offering Department	Earth Scient	ences Quota						
Course Co-ordinator	Dr C Ding	gle, Earth Sciences (cdingle@hku.hk)						
Teachers Involved	Dr C Ding	gle, Earth Sciences						
Course Objectives	interconne To conve impacts a To better	o provide students with an inter-disciplinary introduction to Environmental Science highlighting th iterconnections between biological, geological, and chemical processes. o convey the basic science behind environmental interactions and place it within the context of huma npacts and dependence on the natural world. o better understand how humans interact, manage, and sustain the environment within the context of or conomies, governments and individual choices.						
Course Contents & Topics	Part I: The earth scientification of the environment of the environment of the east of the earth of	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, a arth science concepts essential to environmental science, understanding the underlying causes invironmental problems (human population growth and economics). Part II: Using and conserving our resources: how we use and misuse key natural resources; the difficulty issuring 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 anderstanding our contribution to global climate change.						
Course Learning Outcomes	On succe	ssful completion of this course, students should be able to:						
		CLO 1 explain and describe connections between the physical and biological components of environment and discuss the impact of human activities on the environment						
	CLO 2 explain the concept of environmental sustainability, give examples of how society can behavior to achieve sustainability							
		understand how we are overusing our resources and compare different apprepecific problems presented in class	paches to resolving					
(and Co-requisites and			paches to resolving					
(and Co-requisites and Impermissible combinations)	NIL		Dec					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016	NIL	specific problems presented in class						
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017	NIL Y 1st	specific problems presented in class						
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	NIL Y 1st	specific problems presented in class	Dec					
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	NIL Y 1st Y A+ to F	sem Examination Demonstrate thorough understanding of the subject and an ability to apply knowledge gained of complex, familiar and unfamiliar situations. Show evidence of logical thinking and	Dec in class to a wide range some original thought. liar and some unfamiliar					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	NIL Y 1st Y A+ to F	Sem Examination Demonstrate thorough understanding of the subject and an ability to apply knowledge gained of complex, familiar and unfamiliar situations. Show evidence of logical thinking and Coursework completed on time and to a high academic standard. Demonstrate a good understanding of the subject and an ability to apply knowledge to fami situations. Show evidence of logical thinking abilities. Coursework completed on time and situations. Show evidence of logical thinking abilities. Coursework completed on time and situations.	Dec in class to a wide range some original thought. liar and some unfamiliar and to a good academic owledge to most familiar					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	NIL Y 1st Y A+ to F A B	Demonstrate thorough understanding of the subject and an ability to apply knowledge gained of complex, familiar and unfamiliar situations. Show evidence of logical thinking and Coursework completed on time and to a high academic standard. Demonstrate a good understanding of the subject and an ability to apply knowledge to fami situations. Show evidence of logical thinking abilities. Coursework completed on time and standard. Demonstrate general but incomplete understanding of the subject and an ability to apply knowledge to fami standard.	in class to a wide range some original thought. Iliar and some unfamiliar ind to a good academic bulledge to most familiar insework incomplete, but					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	NIL Y 1st Y A+ to F A B C	Demonstrate thorough understanding of the subject and an ability to apply knowledge gained of complex, familiar and unfamiliar situations. Show evidence of logical thinking and Coursework completed on time and to a high academic standard. Demonstrate a good understanding of the subject and an ability to apply knowledge to fami situations. Show evidence of logical thinking abilities. Coursework completed on time and standard. Demonstrate general but incomplete understanding of the subject and an ability to apply knowledge to submitted on time and in an adequate academic standard. Demonstrate partial but limited grasp of the subject and a limited ability to apply know situations. Show only able to apply knowledge to simple examples. Show little evide	in class to a wide range some original thought. Iliar and some unfamiliar and to a good academic owledge to most familiar ursework incomplete, but vieldge to some familiar nace of logical thinking.					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	NIL Y 1st Y A+ to F A B C D Fail	Demonstrate thorough understanding of the subject and an ability to apply knowledge gained of complex, familiar and unfamiliar situations. Show evidence of logical thinking and Coursework completed on time and to a high academic standard. Demonstrate a good understanding of the subject and an ability to apply knowledge to fami situations. Show evidence of logical thinking abilities. Coursework completed on time and standard. Demonstrate general but incomplete understanding of the subject and an ability to apply knowledge to fami situations. Show some evidence of logical thinking, but with some inconsistencies. Some cousubmitted on time and in an adequate academic standard. Demonstrate partial but limited grasp of the subject and a limited ability to apply know situations. Show only able to apply knowledge to simple examples. Show little evide Coursework submitted late to a poor standard. Demonstrate little or no understanding of the subject and very little or no ability to apply	in class to a wide range some original thought. Iliar and some unfamiliar and to a good academic owledge to most familiar ursework incomplete, but vieldge to some familiar nace of logical thinking.					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	NIL Y 1st Y A+ to F A B C D Fail	Demonstrate thorough understanding of the subject and an ability to apply knowledge gained of complex, familiar and unfamiliar situations. Show evidence of logical thinking and Coursework completed on time and to a high academic standard. Demonstrate a good understanding of the subject and an ability to apply knowledge to fami situations. Show evidence of logical thinking abilities. Coursework completed on time and standard. Demonstrate general but incomplete understanding of the subject and an ability to apply knowledge to submitted on time and in an adequate academic standard. Demonstrate partial but limited grasp of the subject and a limited ability to apply knowledge to simple examples. Show little evide Coursework submitted late to a poor standard. Demonstrate little or no understanding of the subject and very little or no ability to apply situations. Show no evidence of logical or coherent thinking. Coursework missing or substance.	in class to a wide range some original thought. Iliar and some unfamiliar and to a good academic owledge to most familiar ursework incomplete, but vieldge to some familiar nace of logical thinking.					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	NIL Y 1st Y A+ to F A B C D Fail Lecture-b	Demonstrate thorough understanding of the subject and an ability to apply knowledge gained of complex, familiar and unfamiliar situations. Show evidence of logical thinking and Coursework completed on time and to a high academic standard. Demonstrate a good understanding of the subject and an ability to apply knowledge to fami situations. Show evidence of logical thinking abilities. Coursework completed on time and standard. Demonstrate general but incomplete understanding of the subject and an ability to apply knowledge to fami situations. Show some evidence of logical thinking, but with some inconsistencies. Some cot submitted on time and in an adequate academic standard. Demonstrate partial but limited grasp of the subject and a limited ability to apply know situations. Show only able to apply knowledge to simple examples. Show little evide Coursework submitted late to a poor standard. Demonstrate little or no understanding of the subject and very little or no ability to apply situations. Show no evidence of logical or coherent thinking. Coursework missing or substance ased course	in class to a wide range some original thought. Iliar and some unfamiliar and to a good academic owledge to most familiar insework incomplete, but vieldge to some familiar nice of logical thinking. I whowledge to familiar ard.					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	NIL Y 1st Y A+ to F A B C D Fail Lecture-b Activitie	Demonstrate thorough understanding of the subject and an ability to apply knowledge gained of complex, familiar and unfamiliar situations. Show evidence of logical thinking and Coursework completed on time and to a high academic standard. Demonstrate a good understanding of the subject and an ability to apply knowledge to fami situations. Show evidence of logical thinking abilities. Coursework completed on time and standard. Demonstrate general but incomplete understanding of the subject and an ability to apply knowledge to fami situations. Show some evidence of logical thinking, but with some inconsistencies. Some cot submitted on time and in an adequate academic standard. Demonstrate partial but limited grasp of the subject and a limited ability to apply know situations. Show only able to apply knowledge to simple examples. Show little evide Coursework submitted late to a poor standard. Demonstrate little or no understanding of the subject and very little or no ability to apply situations. Show no evidence of logical or coherent thinking. Coursework missing or substance assed course	in class to a wide range some original thought. liar and some unfamiliar and to a good academic owledge to most familiar irrsework incomplete, but all the control of logical thinking. Very knowledge to familiar and. No. of Hours					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	NIL Y 1st Y A+ to F A B C D Fail Lecture-b Activitie Lectures	Demonstrate thorough understanding of the subject and an ability to apply knowledge gained of complex, familiar and unfamiliar situations. Show evidence of logical thinking and Coursework completed on time and to a high academic standard. Demonstrate a good understanding of the subject and an ability to apply knowledge to fami situations. Show evidence of logical thinking abilities. Coursework completed on time and standard. Demonstrate general but incomplete understanding of the subject and an ability to apply knowledge to submitted on time and in an adequate academic standard. Demonstrate partial but limited grasp of the subject and a limited ability to apply knowledge to simple examples. Show little evide Coursework submitted late to a poor standard. Demonstrate little or no understanding of the subject and very little or no ability to apply situations. Show no evidence of logical or coherent thinking. Coursework missing or substances. Details group discussion/case studies	in class to a wide range some original thought. liar and some unfamiliar and to a good academic cowledge to most familiar arresework incomplete, but wiledge to some familiar ince of logical thinking. y knowledge to familiar lard. No. of Hours					

Assessment Methods and Weighting	Methods Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments	Assignments Field trips, group project, media assignment		CLO 1,2,3
	Examination	Final Exam	40	CLO 1,2,3
	Test	Three in class quizzes	30	CLO 1,2,3
Required/recommended reading and online materials		he Environment (Thomson, 2007, 15th n: Essential Environmental Science (V		

ENVS3004 Environment,			iica (o cieulia)			cademic Year	2015	
Offering Department	Earth Scie				Q	uota		
Course Co-ordinator	Prof Y Q Z	Zong, Eart	h Sciences (yqzong@	hku.hk)				
Teachers Involved	Prof Y Q 2	Zong, Eart	h Sciences					
Course Objectives	rural and accumulat major env managem as land, a	nis course follows up issues highlighted in the introductory course and provides in-depth studies about ral and urban environments for students to examine the problems of resource scarcity and pollutar commulation in the natural environment, which human society is confronted. The course will focus or ajor environmental problems and explore how Environmental Economics can be applied for resource anagement and environmental protection. Students will analyze the nature of key natural resources such a land, air and water, and explore ways to improve resource management, protect the environment and evelop sustainable economies.						
Course Contents & Topics	Basic con Resourse Managem	/aluing the environment Basic concepts of Environmental Economics Resourse management for energy, land, water and air Management of waste Planning and regulations for a sustainable future						
Course Learning Outcomes	On succes	ssful comp	eletion of this course, s	tudents sho	ould be able to:			
			te knowledge and cruman society and the			nplexity and inte	erconnectedness	
	CLO 2 re	ecognise a	appropriate use and m	isuse of nat	tural resources			
	CLO 3 a	ssess eco	nomic solutions and p	olicies for s	olving environmenta	l problems		
Pre-requisites (and Co-requisites and Impermissible combinations)	and hydro		following: CHEM2041 ENVS2001 Environme		• • • • • • • • • • • • • • • • • • • •			
Offer in 2015 - 2016	Y 1st	sem			E	xamination	Dec	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	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	B Demonstrate substantial command of the course material and an ability to apply knowledge to familiar and sunfamiliar situations. Show evidence of analytical, critical thought to some complex issues. Apply effective organizational and presentational skills.						
	С	C Demonstrate general but incomplete command of the course material and an ability to apply knowledge to mo familiar situations. Show evidence of some critical and logical thinking abilities. Apply moderately effective organizational and presentational skills.						
	D	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. App limited or barely effective organizational and presentational skills.						
	Fail	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-ba	ased cour	se					
Course Teaching	Activities	s		De	etails		No. of Hours	
& Learning Activities	Lectures			12	sessions of 2 hrs		24	
	Group wo	ork					12	
	Project w	ork					12	
	Discussion	on					12	
	Reading	/ Self stud	у				100	
Assessment Methods and Weighting	Methods	.	Details	,	Weighting in fina course grade (%		sment Methods o CLO Mapping	
	_				-	O CLO	2400	
	Essay				5	0 CLC	0 1,2,3	

Required/recommended reading and online materials	Tietenberg and Lewis: Environmental economics and policy Keller and Botkin: Essential Environmental Science (John Wiley & Sons, 2008) Kaufmann and Cleveland: Environmental Science (Amazon, 2008) Middleton N.: The Global Casino: An Introduction to Environmental Issues (Arnold, 1999)
Additional Course Information	Previous course code: ENVS2004 Compulsory to 4-year students

ENVS3007 Natural hazards	and mitiga	ition (6	credits)			Academic	Year	2015
Offering Department	Earth Scier	arth Sciences Quota						
Course Co-ordinator	Prof Y Q Z	ong, Ear	th Sciences (yqzong@hku.hk	()				
Teachers Involved	Prof Y Q Z	ong, Ear	th Sciences					
Course Objectives	flood, lands entirely na developing	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 & Topics	Geological Climatic ha Preparedne Risk asses	Key characteristics of natural hazards Geological hazards and mitigation measures Climatic hazards and mitigation measures Preparedness and responses to large natural disasters Risk assessment and disaster management Financial (insurance) instruments for economic recovery						
Course Learning Outcomes	On success	sful com	pletion of this course, students	s should	be able to:			
			ate knowledge and critical ur the human aspects of the haza					
Pre-requisites (and Co-requisites and Impermissible combinations)			Introduction to atmosphere a 22 Environmental data analysis	•	osphere or EN	VS2001 Er	vironmen	tal field and lab
Offer in 2015 - 2016	N					Examinat	ion	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A B C D	with evic situation Demons unfamilia organiza Demons familiar organiza Demons problems limited o Demons solve prospective situation of the	trate thorough mastery of the course dence of original thought, and ability s. Demonstrate highly effective organ trate substantial command of the coar situations. Show evidence of attional and presentational skills. trate general but incomplete commastituations. Show evidence of son titional and presentational skills. trate partial but limited command of s. Show evidence of some coherent a rearest partial but limited command of the substantial but limited command of the substantia	to apply kr nizational a ourse mate analytical, a and of the me critical f the cours and logical presentatio nd of cours	nowledge to a wich and presentational and an ability critical thought to course material and logical thin and logical thin thinking, but with nal skills.	de range of co skills. y to apply kno o some com and an ability king abilities limited ability limited analytiery little or no	omplex, fami owledge to opplex issues or to apply k Apply mo or to apply k ical and crit	liar and unfamiliar familiar and some s. Apply effective nowledge to most derately effective nowledge to solve cal abilities. Apply pply knowledge to
Course Type	Lecture-ba	sed cour	rse					
Course Teaching	Activities			Details	•			No. of Hours
& Learning Activities	Lectures			Details	•			No. of Hours
	Tutorials			Project	t tutorials			8
	Discussion	1			discussion			16
	Reading /		4v	Group	discussion			100
	ixeauiig /	Sell Stut	ıy					100
Assessment Methods and Weighting	Methods		Details		Weighting in course grade			nent Methods CLO Mapping
	Examination	on				50	CL	0 1
	Project rep	orts				50	CL	0 1
Required/recommended reading and online materials	Bryant E.: I	Natural F	ental Hazards: Assessing Ris Hazards (Cambridge Universit dman: Natural Hazards and D	ty Press,	2005)	`	lge, 2004)	
Additional Course Information	Previous co	ourse co	de: ENVS2007					

ENVS3020 Global change e	VS3020 Global change ecology (6 credits) Academic Year		2015
Offering Department	Earth Sciences	Quota	50
Course Co-ordinator	Dr C Dingle, Earth Sciences (cdingle@hku.hk)		

Course Objectives	ecosystem	ns. This	ents to the ways in which envi course will explore the contri reases in greenhouse gases a	butions that	human populat	ion growth a	nd globalizatio		
			ise, and, ultimately, impacts on			ge, biological	iiivasioiis, iaii		
Course Contents & Topics	emerging, humans I environme organisms use chang environme climate wa globalizati these hum and their	Environmental change is a natural phenomenon, with ecosystems continually shifting, rearrangi emerging, and disappearing through geologic time with changes in climatic conditions. The activities humans have added to this natural variation, increasing the magnitude and speed with whenvironmental change occurs. This course will focus principally on the effects of climate change organisms and ecosystems but will also investigate other topics registering on a global scale including lause change, biological invasions, and pollution, as well as synergistic interactions between all of 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) higher globalization has contributed to the spread of alien species and disease. The course will investigate his these human-caused stressors affect the morphology, phenology, distribution, and evolution of organis and their impacts on ecosystem functioning and biodiversity in freshwater, marine, and terrest ecosystems.							
Course Learning Outcomes	On succes	On successful completion of this course, students should be able to:							
			a basic understanding of what and use change, are and how the				ciated impacts		
			ne ways that global change affe estem level	cts organisn	ns' traits and dist	ributions, and	l biodiversity a		
		nderstar hange	nd the differences between clin	nate change	on a geologic ti	me scale and	recent climate		
	CLO 4 b	e aware	of the relationships between hi	umans and g	lobal change				
Pre-requisites (and Co-requisites and Impermissible combinations)			01 Environmental field and lal	o course or	ENVS2002 Env	vironmental o	ata analysis d		
Offer in 2015 - 2016	N				Exam	nination			
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original thought, ability to integrate and synthesize information, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective presentational skills. Strong evidence of clear attention to thoughtful and reflective thinking.								
	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, integration of materials and ability to apply knowledge to familiar and some unfamiliar situations. Demonstrate effective presentational skills. Evidence of clear attention to thoughtful and reflective thinking.								
	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the cours 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.								
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learn outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities a little attempt at integration. Show limited ability to apply knowledge to solve problems. Apply limited effectiveness presentational skills. Lack of attention to thoughtful and reflective thinking.						ritical abilities and		
	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 cou	irse						
Course Teaching	Activities	5		Details			No. of Hours		
& Learning Activities	Lectures						24		
	Tutorials						12		
	Project w	ork		Problem-ba	ased exercises		20		
	Reading /	/ Self stu	ıdy				100		
Assessment Methods and Weighting	Methods		Details		hting in final se grade (%)		ment Methods CLO Mapping		
	Assignme	ents	problem-based exercises (10 continuous assessment (10%)		20	CLO 1	,2,3,4		
	Essay		Essay and presentation		30	CLC	1,2		
	Examinat	ion			30	CLO 1	,2,3,4		
	Test		Mid-term test		20	CLO 1	,2,3,4		
Required/recommended reading and online materials		Recommended books: Lovejoy, T.E. and Hannah, L. 2005. Climate Change and Biodiversity. Yale University Press, New H							
and online materials		etal 201	1. Climate Change Biology. CA	AB Internatio	nal, Oxford LIK				

	Araujo, M.B., and Rahbek, C. 2006. How does climate change affect biodiversity? Science 313:1396-1397. Grimm, N.B., Faeth, S.H., Golubiewski, N.E., Redman, C.L., Wu J., Bai, X., and Briggs, J.M. 2008. Global change and the ecology of cities. Science 319:756-760. Schlesinger, W.H. 2006. Global change ecology. Trends in Ecology and Evolution 21:348-351.
Course Website	http://moodle.hku.hk/
Additional Course Information	This course will be offered subject to a minimum enrollment number and availability of teachers.

ENVS3042 Pollution (6 cree	dits)				Academic	Year	2015	
Offering Department	Earth Scie	ences			Quota		40	
Course Co-ordinator	Dr B Thib	odeau, Eart	h Sciences (bthib@hku.hk)				
Teachers Involved	Dr B Thib	odeau, Eart	h Sciences					
Course Objectives	environme and envir	ent. The co onmental ri	s to the most important phy urse will provide the basic sk assessment. The cours ttmosphere, soil and land p	s of conta e will also	minant transport, toxic	ology, po	llution monitoring	
Course Contents & Topics	Physical, Contamin Environm Water Pol Atmosphe Soil and L Monitoring	ants Transpental Toxico llution eric Pollution and Pollution	nd Biological Contaminants oort Processes ology	5				
Course Learning Outcomes	On succe	ssful compl	etion of this course, studen	ts should	be able to:			
	CLO 1	identify the	most important pollutants					
	CLO 2	describes th	ne mechanisms responsible	e for the tr	ansport of pollutants in	the envir	onment	
	CLO 3	evaluate the	e environmental toxicity of	different ty	pe of contamination			
	CLO 4	present the	most important cases of e	nvironmen	tal pollution			
	CLO 5	analyze lab	-generated data and comm	nunicate th	e results and interpreta	itions		
Pre-requisites (and Co-requisites and Impermissible combinations)	BIOL1110 chemistry	From mole or CHEM2	General chemistry I; and Pecules to cells or ENVS130 442 Fundamentals of org Environmental data analys	1 Environ anic chen	mental life science; and	d CHEM2	2041 Principles of	
Offer in 2015 - 2016	Y 2nd	d sem			Examinat	ion	No Exam	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	В	evidence of appropriate	ilities and logical thinking, with use of data and results to draw ntational skills.					
	В	effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions. Apply organizational and presentational skills.						
	Demonstrate general but incomplete grasp of the subject. Evidence of some analytical and critical abilities and thinking. Apply moderately effective lab skills and techniques. Mostly correct but some erroneous use of da results to draw appropriate conclusions. Apply moderately effective organizational and presentational skills.							
	D	coherent a	some relevant information, of and critical abilities. Apply aw appropriate conclusions.	partially ef	fective lab skills and			
	Fail	lack of and and techn	ite evidence of little or no grasp alytical and critical abilities, logica iques. Misuse of data and resu anal skills are minimally effective o	ent thinking. Apply minimally inable to draw appropriate	effective or	ineffective lab skills		
Course Type	Lecture w	ith laborato	ry component course					
Course Teaching	Activitie	s		Details	i		No. of Hours	
& Learning Activities	Lectures						30	
	Laborato	ry					24	
	Reading	/ Self study					90	
Assessment Methods and Weighting	Methods	•	Details		Weighting in final course grade (%)		sment Methods o CLO Mapping	
	Assignm	ents			40		O 1,2,3,4,5	
		ry reports	completion of all mandatory to pass	labs is	15		, , , , , -	
	Presenta	ition			10			
	Project re	eport	solo research project		15			

	Test	20	
Required/recommended reading and online materials	Environmental and Pollution Science, Second Edition, 200 by Ian L. Pepper (Author), Charles P. Gerba (Author), Mar)
Additional Course Information	Completion of ALL laboratory reports is mandatory to pass	s this course.	

ENVS3313 Environmental of		· · · · · · · · · · · · · · · · · · ·	Acade		2015				
Offering Department	Earth Sciences		Quota						
Course Co-ordinator		arth Sciences (cnot@hku.hk)							
Teachers Involved	Dr C A Not, Ea Dr D Baker, Bi	arth Sciences ological Sciences							
Course Objectives	highlight the conditions. To convey the	dents with a thorough introduction importance of the (paleo)ocear basic science behind ocean-atnext of human's connectedness to the science behind ocean-atnext ocean-at	nographic processes to environmental environ	rironmental a	and ecologic				
Course Contents & Topics	and their impa contain 98% of properties governments system including specifically ex	To provide a solid foundation of knowledge about the physical processes dictating the oceans moven and their impacts on the environment and ecosystems. The oceans take up 71% of earth's surface contain 98% of the water. By looking at the structure of the atmosphere, thermodynamic principals properties governing sea water, we will evaluate the critical roles the ocean plays in the environm system including its influence on (paleo)climate, coastal resources, and nutrient cycling. Case st specifically examining changes in sea level rise, El Nino, and (paleo)climate will be used to conoceanographic principles to environmental problems.							
Course Learning Outcomes	On successful	completion of this course, students	s should be able to:						
	CLO 1 descr	ibe the major surface and deep cur	rents of the ocean						
		fy and describe important process nt transport	ses in the ocean controlling	large scale o	circulation and				
	CLO 3 descr	ibe sources and distribution of critic	cal chemicals and sea water p	roperties in th	e ocean				
	CLO 4 illustra	ate connections between physical o	ocean processes, climate syst	ems and biolo	ogical activity				
Pre-requisites and Co-requisites and mpermissible combinations)		S2001 Environmental field and la logy and evolution or EASC2404 Ir							
Offer in 2015 - 2016	Y 2nd sen	1	Exami	xamination May					
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining th entire course learning outcomes. Show ability to think logically and critically, with evidence of original though Critically evaluate data and results to draw appropriate and insightful conclusions. Apply highly effectiv 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 logical and critical thought. Apply effective organizational and presentational skills. Correctly use of data and 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 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 Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of critical, logical and/or coherent thinking. Organization and presentational skills are minimally effective or ineffective. Misuse of data and results and/or unable to draw appropriate conclusions.								
Course Type	Lecture with la	boratory component course							
Course Teaching & Learning Activities	Activities		Details		No. of Hours				
x Learning Activities	Lectures		12 sessions x 2 hours		2				
	Laboratory		5 labs x 2 hours		1				
	Field work		1 day field trip						
	Project work		group presentation		1				
	Reading / Sel	f study			9				
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)		nent Method CLO Mappin				
	Assignments	3 tutorials of 5% each	15	CLO 1					
	Examination	2 hour written final exam	35	CLO 1					
	Presentation		30	3,4					

		experiential learning activities (report 15%, presentation 10%, poster 5%)		
	Test	2 hour mid-term test	20	CLO 1,2,3
Required/recommended reading and online materials	Abel and M Publishers. Garrison, 20	Environmental Oceanography: Second Ed dcConnell, 2009. Environmental Ocear 04. Oceanography: An Invitation to Maring 9. Paleoclimates: Understanding Climat	nography: Topics an e Science. 5th edition.	. Brooks Cole.
Additional Course Information	Course will b	e offered every year starting from 2014-2	015 and coordinated b	oy DES.

ENVS3999 Directed stud	ies in env	ironmenta	al science (6 credits)		Academic Year	2015		
Offering Department	Earth Scient	ences			Quota			
Course Co-ordinator	Dr C Ding	le, Earth Sc	iences (cdingle@hku.hk)					
Teachers Involved	Various te	eachers in th	e Department, Earth Sciences	3				
Course Objectives			s knowledge on a particular t ninking skills.	topic in environmenta	al science and s	tudents self-directed		
Course Contents & Topics	material b	eyond textb	extensive reading on a selection ooks. Students are required to the introduced the interest of the second of the s			•		
Course Learning Outcomes	On succe	ssful comple	etion of this course, students s	hould be able to:				
	CLO 1	complete a	research task independently	in one or more topica	l areas of the ma	jor		
	CLO 2	show comp	petence in formulating their ow	n scientific argument				
Pre-requisites (and Co-requisites and Impermissible combinations)	Science M Cumulativ This caps The earlie	/lajor. /e GPA of 2. tone course	edits of advanced level (level 5 or above in Environmental S is for Environmental Science dent is allowed to take this ca	Science Major. Major students only.		ses in Environmenta		
Offer in 2015 - 2016	Y Ye	ar long			Examination	No Exam		
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrates excellent understanding of the topic, excellent development of argument, logical analysis and insight in the topic, with evidence of original thought. Insightful use and critical analysis of information drawn from a full range high quality sources to draw appropriate and insightful conclusions. Presented in high academic standard. Work of I should show considerable additional work beyond that is required in wider areas relevant to the topic.						
	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.							
	C 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.							
	D Demonstrate partial but limited grasp of the chosen topic, with retention of some relevant information. 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 to draw appropriate conclusions from the sources.							
	Fail Show 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		/ Self study		research work & re	port	120		
Assessment Methods and Weighting	Methods	S	Details	Weighting course gra		sessment Methods to CLO Mapping		
	Oral pres	sentation			10	CLO 1,2		
	Research	h report			90	CLO 1,2		

ENVS4966 Environmer	ntal science internship (6 credits)	Academic Year	2015
Offering Department	Earth Sciences	Quota	
Course Co-ordinator	Dr C Dingle, Earth Sciences (cdingle @hku.hk)		
Teachers Involved	Dr C Dingle, Earth Sciences		
Course Objectives			

								or of study. This work he real environmental		
Course Contents & Topics	as instruction students of member of	Students will be supervised by a staff member (the Internal Supervisor) within the University of Hong Kong is instructed by the Internal Supervisor. In the case of the work being carried out in an external agency, tudents will be supervised by a staff member of the external agency (the External Supervisor) and a staff member of the University (the 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 Outcomes	On successful completion of this course, students should be able to:									
	CLO 1 gain at least 4 weeks of work experience environmental-related firm or the Government									
	CLO 2	CLO 2 acquire an understanding and appreciation of the real work environment								
	CLO 3	have som	ne experiei	nce with applying le	earned	I knowledge to solv	ing real world	problems		
Pre-requisites (and Co-requisites and Impermissible combinations)	Science N This caps	∕lajor. tone cour	se is for E	nvironmental Scier	nce Ma	, , ,		rses in Environmental		
Offer in 2015 - 2016	Y 1st	sem 2n	nd sem S	Summer			Examination	No Exam		
Offer in 2016 - 2017	Υ									
Course Grade	Pass/Fail									
Grade Descriptors	Pass Fail	the job colleagu working performa Very lim assigned colleagu	or assigned ues, and clier hours, writt ance in the al lited or no ab d by superv ues, or clients	I by supervisor(s). Es this in the job. Success en and oral report, a bove would be awarded ility to solve problems i isor(s). Fails to estab	tablishe fully full and eva I a grade n the wo lish effitisfy the	s effective collaboration fills the requirements s iluation by supervisor(e of "Distinction". prkplace. Fails to handle ective collaboration or requirements set out in	n and communicet out in the Coust, etc. Students	is out the work required in cation with supervisor(s), rse Description regarding demonstrating excellent work required in the job or with supervisor(s), other cription regarding working		
Course Type	Internship			,	,					
Course Teaching	Activitie				De	etails		No. of Hours		
& Learning Activities	Internshi				it	is expected that st ork at least 160 h quivalent of 4 week	ours (or the	160		
Assessment Methods and Weighting	Methods	•	Details			Weighting in fi		ssessment Methods to CLO Mapping		
	Written re	eport	written feedback	report, emp and oral presenta	loyer's tion		00	CLO 1,2,3		
Course Website	http://moo	dle.hku.h	ık/							
Additional Course Information	equivalent Satisfacto internship Students Enrolmen	t of 4 wee ory comple will be rewho are in t of this	eks full-time letion of t ecorded o nterested t course is	e), supervised by a his course can b in the student's tra o enrol in this cour not conducted via	staff recounts of the country of the	member. nted towards the t. This course will ould contact the De online course sele	Capstone red be assessed partment to ob ction system	ast 160 hours (or the quirement. Details of on "Pass/Fail" basis. tain the approval. and should be made e course coordinator.		

ENVS4999 Environmental	science	project (12 credits)	Academic Year	2015						
Offering Department	Earth So	ciences	Quota							
Course Co-ordinator	Prof Y C	Zong, Earth Sciences (yqzong@hku.hk)								
Teachers Involved	Various	teachers in the Department, Earth Sciences								
Course Objectives	To enha	nce students knowledge and research skills in advanced leve	l of environmental sci	ence.						
Course Contents & Topics	a staff n	s undertake a research project in the form of an undergradua nember. The project could be based on one of the four area: s of interdisciplinary nature. The dissertation should show an -trivial manner.	s covered by the maj	or and must shov						
Course Learning Outcomes	On successful completion of this course, students should be able to:									
	CLO 1	complete a dissertation project of undergraduate level in one	of the four areas of t	he major						
	CLO 2	show competence in formulation, data collection, analysis, at	nd presentation of a re	esearch project						
Pre-requisites (and Co-requisites and Impermissible combinations)	Science and Stu This cap	at least 24 credits of advanced level (level 3 or 4) disciplinary Major; dents must have a cumulative GPA of 3.0 or above in Environ ostone course is for Environmental Science Major students on liest that a student is allowed to take this capstone course is the state of the course is the course is the course is the capstone course is the course is th	mental Science Major ly.							
Offer in 2015 - 2016	Y Y	ear long	Examination	No Exam						

Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	Demonstrates excellent understanding of the topic, excellent development of argument, logical analysis and insight into the topic, with evidence of original thought. Insightful use and critical analysis of information drawn from a full range of high quality sources to draw appropriate and insightful conclusions. Presented in high academic standard. [Work of A+ should show considerable additional work beyond that is required in wider areas relevant to the topic.]							
	В	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.							
	С	resear	rched at a very basic level. N	lostly correct		e chosen topic were addressed and relevant information from sources,			
	D	some severa	coherent and logical thinking, b	out with limite	ed analytical and critical abilities.	e relevant information. Evidence of Demonstrate use and reference of rison. Limited to draw appropriate			
	Fail								
Course Type	Project-b	ased cou	urse						
Course Teaching	Activiti	es			Details	No. of Hours			
& Learning Activities	Reading	g / Self st	udy	r	esearch work & report	240			
Assessment Methods and Weighting	Method	ls	Details		Weighting in final course grade (%)	Assessment Methods			
	Disserta	ation			100	CLO 1,2			
Additional Course Information			code: ENVS3015. jor coordinator is required						

MATH1009 Basic mathema			ana	CCOIIC		U	CIE	uits			- /	Academi	c rear	2015	
Offering Department	Mathemati											Quota		380	
Course Co-ordinator	Dr Y M lawkaho@				Dr	K	Н	Law	(2nd	sem),	Math	nematics	(ymchai	n @math	s.hku.hl
Teachers Involved	Dr Y M Ch Dr K H Lav														
Course Objectives	courses in Economics	his course aims at introducing important topics of mathematics for introductory or intermediate level burses in Business and Economics. Mathematical concepts and methods, as well as some Business and conomics applications, would be emphasized so that students could be furnished with the essential athematical skills for the senior courses in these disciplines.													
Course Contents & Topics	1. Logic 2. Linear E 3. Quadrai 4. Graphs 5. Differen 6. Uncons 7. Partial c 8. Constra 9. Integrat 10. Geom 11. Differe 12. Differe 13. Matrix	tic Equation and Functiation strained odifferentiation etric serie ence equation equation equation etric serie equation	ions ctions ptimization mizati es ations ations	ation on (optior	nal)										
Course Learning Outcomes	On succes														
		emonstra conomics		owledg	e and	d und	ers	tandir	ng of t	ne esse	ential m	nathemat	ics used	in busin	ess and
	CLO 2 a	pply matl	hemat	ical skil	ls to	mode	el ar	nd sol	ve bas	ic probl	ems in	business	and eco	nomics	
		CLO 3 be more capable of coping with a higher level of mathematics required in various economic disciplines													
Pre-requisites (and Co-requisites and Impermissible combinations)	HKDSE M	NIL The course has no pre-requisite, but students are expected to have already achieved Level 2 or above HKDSE Mathematics or equivalent. Not for students who have passed MATH1011 University mathematic I or MATH1013 University mathematics II, 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).													
	This cours	se is exc	lusive	ly for r	on-S									tudents	from the
Offer in 2015 - 2016	This cours Faculty of	se is exc	lusive or En	ly for n	on-S						g stude		not for s		from the
Offer in 2015 - 2016 Offer in 2016 - 2017	This cours Faculty of	se is exc Science	lusive or En	ly for n	on-S						g stude	ents (i.e.	not for s		
Offer in 2016 - 2017	This cours Faculty of Y 1st	se is exc Science	lusive or En	ly for n	on-S						g stude	ents (i.e.	not for s		
	This cours Faculty of Y 1st	se is exc Science sem 2r	clusive or Eng and sen strate a as and t ang and	ly for r gineerin n n excelle	non-Sing). ent un cation:	dersta s throu	nding	g of k correctly	ey concy analys	epts and	g stude	ents (i.e. Examinate by being a arly and ele	not for s	Dec	May ppropriate ect logical
Offer in 2016 - 2017 Course Grade	This cours Faculty of Y 1st Y A+ to F	See is exc Science sem 2r Demons theorem reasonir innovativ	clusive or Engand sen strate as and t ng and ve apprestrate a plication	ly for r gineerir n excelle heir appli argumer oaches to good unc s throug	ent un cation tation o solviiderstarh corre	dersta s through the standard	nding gh coeing blem	g of k correctly g able is. y concessing pr	ey conc y analys to carry	epts and ng proble out con ideas by but with	g stude I ideas tems, cleanputation being absome mi	ents (i.e. Examinat by being a arrly and ele as carefully ble to identifinor inadeq	not for s	Dec	May ppropriate ect logical with some
Offer in 2016 - 2017 Course Grade	This cours Faculty of Y 1st Y A+ to F	Demons their ap the appropriate of the process of t	clusive or England send send send tags and tags and tags and tags and tags and tags and tags are application repriate as strate as s, but we	n excellenter of the control of the	ent un cation: ntation o solvii derstar h corres or the able ur e inad	dersta s through and the and the ng prolonding coectly a eir app	ndingh coeing	g of k correctly g able is. y conce sing pr ions ar ng of ke n apply	ey concey analys to carry epts and oblems, and preservey conceying the	epts and ng proble out con ideas by but with ntation or pts and i	g stude I ideas tems, cleanputation being at some mi with som deas by sthrough	ents (i.e. Examinat by being a arrly and ele as carefully ble to identify inor inadeque me minor co being able	not for s tion ble to iden gantly prese and correc fy the appro	Dec	May ppropriate ect logical with some orems and identifying ppropriate
Offer in 2016 - 2017 Course Grade	This cours Faculty of Y 1st Y A+ to F B	Demons theorem argument Demons but with	strate and send service and send trate and the service and the	n excelled heir application of the second with some resentation of the second process through theorem; and acceptation of the second process of the second	ent un cation: tation of a solvin	dersta s throu and t ng prol dding c eetty a eejir app ddersta eequac a numb	nding gh coeing blem If key nalys licati andin ies ii	g of k correctly g able ns. y concessing pricions arm ng of ken n apply of minor	ey concey analyse to carry epts and oblems, do preser ey concey ing the roomput obts and id the th	epts and ng proble out con ideas by but with ntation or pts and it theorems attional erdeas by by	I ideas tems, cleanputation being absome mi with some deas by services.	by being a arrivant elements (i.e. Examinat by being a arrivant elements carefully ble to identifinor inadequent more minor conbeing able h incorrectly eto correctly eto correctly	not for s tion ble to iden gantly prese and correc fy the appro uacies in ar mputational to correctly	Dec tify the a senting correctly, and or priate the guments, errors. identify a problems	May ppropriate ect logical with some orems and identifying ppropriate with poor theorems,
Offer in 2016 - 2017 Course Grade	This cours Faculty of Y 1st Y A+ to F B C	Demons theorem reasonir innovatin Demons theorem argumen Demons but with argumen Demons Demons but Demons but Demons but Demons but Demons Dem	control of the state of the sta	n excellenter application argumer oaches to good unces through theorems of acceptation argumer oaches to good unces through theorems or acceptation argumer under antial in assentation argumentation argument arg	ent un cation: tation or solvin de inado on or a erstancadequa n or will inado.	dersta s throu and t mg prol dding c ectly a eieir app adersta equac ing of acies it h sub:	nding gh coeing blem inding ies in ies in ies oer o key n ap stant	g of k g of k g of k g able ns. y conce sising pr ions ar ng of k apply f mions concepplying tial com derstar	ey concey analys to carry epts and oblems, ad preserving the comput to the thin putation ading by	epts and ng proble out con ideas by but with ntation or theorems ational er deas by beorems tal errors.	I ideas temporation being absorber with some mineral being absorber statement and the some mineral being absorber for s.	by being a arrly and ele so carefully ble to identifinor inadeque me minor cobeing able h incorrectly et o correctly	not for s tion ble to iden gantly press and correct fy the appro uacies in ar imputational to correctly y analysing y identify ag	Dec tify the arenting content, and or priate the guments, errors. identify a problems propriate the content of	May ppropriate ect logical with some prems and identifying ppropriate with poor theorems, with poor
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Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	This cours Faculty of Y 1st Y A+ to F A B C D Fail Lecture-ba	Demons theorem argumen Demons but with argumen Demons applications assed could be seen as expected by the seen argumen argumen Demons applications assed could be seen as expected by the seen argumen between argumen Demons applications assed could be seen as expected by the seen argument between a seen argument betwee	clusive or English and sen of	n excellenter and a comment of the c	ent un cation: tation or solvin de inado on or a erstancadequa n or will inado.	dersta s throu and t mg prol dding c ectly a eieir app adersta equac ing of acies it h sub:	nding gh coeing blem inding ies in ies in ies oer o key n ap stant	g of k correctly g able is. y concec sing pr icions ar ng of ke n apply of minoi of minoi of minoi derstar e the so	ey concey analys to carry epts and oblems, ad preser ey conceying the comput the the the the the putation ading by blution.	epts and ng proble out con ideas by but with ntation or pts and i theorems at deas by becorems tal errors.	I ideas temporation being absorber with some mineral being absorber statement and the some mineral being absorber for s.	by being a arrly and ele so carefully ble to identifinor inadeque me minor cobeing able h incorrectly et o correctly	ble to iden gantly prese and correct fy the appro uacies in ar mputational to correctly of analysing y identify ag analysing	Dec tiffy the anothing contity, and with the guments, errors. identify a problems oppropriate problems as theorem.	May ppropriate ect logical with some orems and identifying ppropriate with poor theorems, with poor so or their some of Hours 15 Hours 36
Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	This cours Faculty of Y 1st Y A+ to F A B C D Fail Lecture-ba Activities Lectures	Demons theorem argumen Demons but with argumen Demons applications.	clusive or English and send send send send send send send tals and	n excellenter and a comment of the c	ent un cation: tation or solvin de inado on or a erstancadequa n or will inado.	dersta s throu and t mg prol ding c ectly a eieir app adersta equac ing of acies it h sub:	nding gh coeing blem inding ies in ies in ies oer o key n ap stant	g of k correctly g able is. y concec sing pr icions ar ng of ke n apply of minoi of minoi of minoi derstar e the so	ey concey analys to carry epts and oblems, ad preser ey conceying the comput the the the the the putation ading by blution.	epts and ng proble out con ideas by but with ntation or pts and i theorems at deas by becorems tal errors.	I ideas temporation being absorber with some mineral being absorber statement and the some mineral being absorber for s.	by being a arrly and ele so carefully ble to identifinor inadeque me minor cobeing able h incorrectly et o correctly	ble to iden gantly prese and correct fy the appro uacies in ar mputational to correctly of analysing y identify ag analysing	Dec tiffy the anothing contity, and to priate their guments, errors. identify a problems propriate problems to the problems to	May ppropriate ect logical with some orems and identifying ppropriate with poor theorems, with poor so or their some flowers.
Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	This cours Faculty of Y 1st Y A+ to F A B C D Fail Lecture-ba Activities Lectures Tutorials	Demons theorem reasonir innovatin Demons theorem argumen Demons applications assed could select the country of	clusive or English and send send send send send send send tals and	n excellent necessarial in excellent necessarial in excepta with some in exceptation acceptation in exceptation	ent un cation: tation or solvin de inado on or a erstancadequa n or will inado.	dersta s throu and t mg prol ding c ectly a eieir app adersta equac ing of acies it h sub:	nding gh coeing blem inding ies in ies in ies oer o key n ap stant	g of k correctly g able is. y concec sing pr icions ar ng of ke n apply of minoi of minoi of minoi derstar e the so	ey concey analys to carry epts and oblems, ad preser ey conceying the comput tots and in the thin putation.	epts and ng proble out con ideas by but with htation or pts and i theorems ational er deas by bear errors. not bein	I ideas the some min with some min able m	by being a arry and ele is carefully ble to identify incorrectly to identify to identify to identify to identify to identify to identify	not for s tion ble to iden gantly press and correct y the appro uacies in ar mputational to correctly y analysing y identify ap analysing appropriate	Dec tify the anting correctly, and we priate the guments, errors. identify a problems expropriate theorem No. c	May ppropriate ect logical with some orems and identifying ppropriate with poor theorems, with poor so or their 36 Hours 12 100 Methods
Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching & Learning Activities Assessment Methods	This cours Faculty of Y 1st Y A+ to F A B C D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods	Demons theorem argumen Demons applications	clusive or English and send send send send send send send se	n excellenter in excellenter application in excellenter application in excepts through theorem; in acceptation in acceptation in exceptation	ent un cation: tation o solvii de inad o sor the able ur e inad o sor the able ur e inad o sor the able ur e inad o solvii de	dersta s s throu and t ing prol cheetiy a cheetiy a chee	nding copeing blem of key nalysilicati undininger of key a key a plete	g of k correctly g able is. y conces sing pr identification f minor derstar e the so	ey concey analys to carry epts and oblems, ad preser ey conceying the comput tots and in the thin putation.	epts and ng proble out con ideas by but with htation or pts and i theorems ational er deas by bear errors. not bein	I ideas the series, clean putation being at some min with some deas by some through in the series able in a ble	by being a large process of the second secon	not for s tion ble to iden gantly prese and correct fy the appro uacies in ar mputational to correctly fy analysing appropriate Assess:	Dec tify the anting constity, and with the guments, errors. identify a problems propriate the problems propriate the problems propriate boroblems propriate boroblems constitution of the problems constitution	May ppropriate ect logical with some orems and identifying ppropriate with poor theorems, with poor as or their services of Hours 36
Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching & Learning Activities Assessment Methods	This cours Faculty of Y 1st Y A+ to F A B C D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignmen	Demons theorem argumen Demons applications // Self students	clusive or English and send send send send send send send se	n excellent necessarial in excellent necessarial in excepta with some in exceptation acceptation in exceptation	ent un cation: tation o solvii de inad o sor the able ur e inad o sor the able ur e inad o sor the able ur e inad o solvii de	dersta s s throu and t ing prol cheetiy a cheetiy a chee	nding copeing blem of key nalysilicati undininger of key a key a plete	g of k correctly g able is. y conces sing pr identification f minor derstar e the so	ey concey analys to carry epts and oblems, ad preser ey conceying the comput tots and in the thin putation.	epts and ng proble out con ideas by but with htation or pts and i theorems ational er deas by bear errors. not bein	I ideas the some min with some min able m	by being a party and ele as carefully be to identify t	not for s tion ble to iden gantly press and correct y the appro uacies in ar mputational to correctly y analysing appropriate Assess to	Dec tify the another section of the content of the	May ppropriate ect logical with some orems and identifying ppropriate with poor theorems, with poor so or their 36 Hours 12 100 Methods
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Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching & Learning Activities Assessment Methods	This cours Faculty of Y 1st Y A+ to F A B C D Fail Lecture-ba Activities Lectures Tutorials Reading / Methods Assignmen	Demons theorem argumen Demons but with argumen Demons applications.	clusive or English and send send send send send send send se	n excellenter and management of the control of the	ent uncation: tation or solvinderstand h corresponders or the solvinderstand h corresponders or the solvinderstand h corresponders or the solvinderstanders or the solvinderstanders of the solvinderstanders of the solvinders of t	dersta s throughout and the and the ground adding a decity a eleir app aderstate a quant the substantial and the equate to comment	ndingh coeing decing the series in the serie	g of k correctly g able iss. y conces sing pr identification g of ke n apply of minoi derstar e the so	ey concey analys to carry epts and oblems, ad preser ey conceying the computation ding by continuities. Details W. C.	epts and ng proble out con ideas by but with ntation or pts and it theorems attional er deas by becorems tal errors. not bein	I ideas thems, clean putation being absome min with some deas by some rors. Being able hrough in min min able hrough in min min able hrough in min	by being a larly and ele is carefully ble to identify incorrectly to identify	not for s tion ble to iden gantly prese and correct fy the appro uacies in ar mputational to correctly y analysing y identify a appropriate Assess to CLC CLC edition)	priate the guments, errors. identify a problems propriate theoretic problems propriate theoretic problems problems propriate problems problems propriate problems propriate problems problems propriate problems problems problems problems probl	ppropriate ect logical with some orems and identifying ppropriate with poor theorems, with poor as or their of Hours 36 12 100 Methods Mapping

MATH1011 University math	Mathemat	-	•		04	<u> </u>			
Offering Department Course Co-ordinator			athematics (hyzhang@maths.hk	u hla	Quota	1			
Teachers Involved				u.nk)					
Course Objectives	-		athematics	athon	natics (or equivalent) h	ookaround a	and provides the		
Course Objectives	with basic	knowl	at students with only HKDSE M edge of mathematics that sen llowed by MATH1013 University	ves a	is essential foundation				
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. Maxima and minima. Indefinite and definite integrals. Area. Integration by substitution. Trapezoidal rule with error estimation. On successful completion of this course, students should be able to: 								
Course Learning Outcomes	On succes	ssful co	mpletion of this course, students	ıld be able to:					
	CLO 1	use the	e set notations; calculate probab	ilities;	and prove by induction	n			
	CLO 2	solve p	roblems involving exponential, le	ogarit	hmic and trigonometri	c functions			
	CLO 3	evaluat	te limits and derivatives						
	CLO 4	compu	te simple definite and indefinite i	integr	als				
	CLO 5	solve p	ractical problems such as determ	minin	g maxima and minima	finding area			
Pre-requisites (and Co-requisites and Impermissible combinations)	Mathemat	ics or e	no pre-requisite, but students are quivalent before enrolling the co vith Level 2 or above in Module ?	urse;	and				
Offer in 2015 - 2016	Y 1st	sem 2	2nd sem		Exam	ination	Dec May		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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 their applications through correctly analysing problems, but with some minor inadequacies in arguments, identify 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 approximate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with argument and presentation or a number of minor computational errors.								
	D Demonstrate some understanding of key concepts and ideas by being able to corbut with substantial inadequacies in applying the theorems through incorrect argument or presentation or with substantial computational errors.								
	Fail		nstrate poor and inadequate understations, or not being able to complete the			ntify appropriat	e theorems or the		
Course Type	Lecture-ba	ased co	urse						
Course Teaching & Learning Activities	Activities	S		Deta	ails		No. of Hour		
a Learning Activities	Lectures						3		
	Tutorials						1:		
	Reading	/ Self st	udy				10		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		ssment Method to CLO Mappin		
	Assignme	ents	assignments, tutori participation, etc	ials,			1,2,3,4,5		
	Examination				50 CLO 1,2,3,4,5				
	Test		3 tests		45		1,2,3,4,5		
Required/recommended reading	(Custom to	extbook) MATH 1011 University Mather	natics	s I (Pearson, 2014)				
and online materials									

MATH1013 University math	,		• •		Academic Year	GEO.	
Offering Department	Mathematic		- (4-t) D- V M (2h (0l)	Quota	650	
Course Co-ordinator	ymchan @m	C W Wong (1st sem); Dr Y M Chan (2nd sem), Mathematics (cwwongab@hku.hchan@maths.hku.hk)					
Teachers Involved			t sem), Mathematics sem), Mathematics				
Course Objectives	background applied in v Concepts o	l and prarious of Math	at students with Core Mathem brovides them with basic know disciplines. It is expected to be nematics), MATH2101 (Linear culus), and MATH2241 (Introduc	vledge of calculus e followed by cours Algebra I), MATH	and some linear a es such as MATH 2102 (Linear Alge	ilgebra that can t 2012 (Fundament	
Course Contents & Topics	- Limits; con - Mean valu - Higher ord - Radian, ca - Definite a fractions. - Complex n - Basic matr	ntinuity le theo der deri alculus nd ind numbe rix and	is; inverse functions. and differentiability. rem; implicit differentiation; L'Ho ivatives; maxima and minima; g of trigonometric functions. lefinite integrals; integration by rs, polar form, de Moivre's form vector (of orders 2 and 3) oper ary differential equations. (option	raph sketching. substitutions; intequals. ula. ations, determinants		, ,	
Course Learning Outcomes	On success	ful cor	npletion of this course, students	should be able to:			
	CLO 1 des	scribe	properties of a function and an	inverse function			
	CLO 2 eva	aluate	various kinds of limits, and dete	ermine continuity and	d differentiability of	functions	
			vanced rules/techniques of diff sketch graphs of functions	ferentiation and inte	egration to comput	te derivatives and	
	CLO 4 sol	ve pro	blems involving complex number	ers			
	CLO 5 perform matrix and vector operations, compute determinants of 2x2 or 3x3 matrices						
			ple first order ordinary differenti	•			
Pre-requisites (and Co-requisites and	University m		in Module 1, or Module 2 of H	NDOE Mathematics	or equivalent, or	1 433 111 111/11/11/11	
	Not for stu (MATH1851	udents I Calci	who have passed MATH18 ulus and ordinary differential e already enrolled in this course.	quations and MATI			
Impermissible combinations)	Not for stu (MATH1851 statistics), o	udents I Calco or have	who have passed MATH18 ulus and ordinary differential e	quations and MATI			
Impermissible combinations) Offer in 2015 - 2016	Not for stu (MATH1851 statistics), o	udents I Calco or have	who have passed MATH18 ulus and ordinary differential e already enrolled in this course.	quations and MATI	H1853 Linear alge	bra, probability a	
Offer in 2015 - 2016 Offer in 2016 - 2017	Not for stu (MATH1851 statistics), o	udents I Calco or have	who have passed MATH18 ulus and ordinary differential e already enrolled in this course.	quations and MATI	H1853 Linear alge	bra, probability ar	
Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Not for stu (MATH1851 statistics), o Y 1st se	Demor theorer reason	who have passed MATH18 ulus and ordinary differential e already enrolled in this course.	quations and MATI	Examination as by being able to iclearly and elegantly produced to the clearly produced to the clearly produced to the clearly produced to the clear to the c	Dec May dentify the appropriat esenting correct logics	
Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Not for stu (MATH1851 statistics), o Y 1st se Y A+ to F	Demor theorer pemor theorer reason innovar	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of the sand their applications through correcting and argumentation and being ab	key concepts and idectly analysing problems, le to carry out compute the computation of the control of the cont	Examination Examination as by being able to iclearly and elegantly putions carefully and co	Dec May dentify the appropriat resenting correct logicarrectly, and with som propriate theorems an arguments, identifyin	
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	Not for stu (MATH1851 statistics), o Y 1st se Y A+ to F	Demor theorei in Demor theorei pemor theorei pemor theorei pemor theorei pemor theorei heorei	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of the sand their applications through correcting and argumentation and being ablitive approaches to solving problems. Instrate a good understanding of key corpoplications through correctly analysing	key concepts and idectly analysing problems, le to carry out computancepts and ideas by being problems, but with some and presentation or with key concepts and ideas plying the theorems three.	Examination Examination Examination as by being able to iclearly and elegantly putions carefully and co g able to identify the ap e minor inadequacies ir some minor computation by being able to corre- bugh incorrectly analys	Dec May dentify the appropriate esenting correct logics rrectly, and with some propriate theorems an arguments, identifying and errors. ctty identify appropriate typopropriate theorems.	
Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Not for stu (MATH1851 statistics), o Y 1st se Y A+ to F	Demor theorer argume Demor but wi	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of the sand their applications through corre- ting and argumentation and being able tive approaches to solving problems. Instrate a good understanding of key cor- polications through correctly analysing propriate theorems or their applications strate an acceptable understanding of the strate and the strate	key concepts and idectly analysing problems, le to carry out computed incepts and ideas by being problems, but with some and presentation or with key concepts and ideas plying the theorems throor computational errors.	Examination Examination Examination as by being able to inclearly and elegantly printions carefully and cong able to identify the aperminor inadequacies in some minor computation by being able to correctly analysis able to correctly identify	Dec May dentify the appropriate resenting correct logical rectly, and with some propriate theorems an arguments, identifying onal errors. city identify appropriating problems with poor y appropriate theorems	
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Not for stu (MATH1851 statistics), o Y 1st set Y A+ to F B C	Demor theorer argume Demor theorer argume Demor theorer argume Demor Detemor Demor	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of ms and their applications through corre- ing and argumentation and being abl- tive approaches to solving problems. Instrate a good understanding of key cor- opplications through correctly analysing propriate theorems or their applications sistrate an acceptable understanding of ms, but with some inadequacies in ap- ent and presentation or a number of mir sistrate some understanding of key conc th substantial inadequacies in applyi	key concepts and idectly analysing problems, le to carry out computed incepts and ideas by being problems, but with some and presentation or with key concepts and ideas plying the theorems throor computational errors. The problems is the problems of the problems in the	Examination Examination Examination as by being able to inclearly and elegantly properties of the p	Dec May dentify the appropriate resenting correct logical rectly, and with some propriate theorems an arguments, identifying onal errors. dentify appropriate theorems and arguments, identifying problems with poor appropriate theorems arguments with poor appropriate theorems arguments with poor appropriate theorems arguments with poor appropriate theorems arguments.	
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	Not for stu (MATH1851 statistics), o Y 1st set Y A+ to F A B C	Demor theorer argume Demor but wi argume Demor applica	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of the sand their applications through corre- ting and argumentation and being abilitive approaches to solving problems. Instrate a good understanding of key corre topplications through correctly analysing propriate theorems or their applications this strate an acceptable understanding of the substantial inadequacies in applications through correctly analysing propriate theorems or their applications the substantial inadequacies in apply the tor presentation or with substantial countries or the substantial inadequacies in apply the tor presentation or with substantial countries. In the substantial inadequacies in apply the tor presentation or with substantial countries or the substantial countries or the substantial countries or the substantial countries.	key concepts and idectly analysing problems, le to carry out computed incepts and ideas by being problems, but with some and presentation or with key concepts and ideas plying the theorems throor computational errors. The problems is the problems of the problems in the	Examination Examination Examination as by being able to inclearly and elegantly properties of the p	Dec May dentify the appropriate resenting correct logical rectly, and with some propriate theorems an arguments, identifying onal errors. dentify appropriate theorems and arguments, identifying problems with poor appropriate theorems arguments with poor appropriate theorems arguments with poor appropriate theorems arguments with poor appropriate theorems arguments.	
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	Not for stu (MATH1851 statistics), o Y 1st set Y A+ to F A B C D Fail	Demor theorer argume Demor but wi argume Demor applica	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of the sand their applications through corre- ting and argumentation and being abilitive approaches to solving problems. Instrate a good understanding of key corre topplications through correctly analysing propriate theorems or their applications this strate an acceptable understanding of the substantial inadequacies in applications through correctly analysing propriate theorems or their applications the substantial inadequacies in apply the tor presentation or with substantial countries or the substantial inadequacies in apply the tor presentation or with substantial countries. In the substantial inadequacies in apply the tor presentation or with substantial countries or the substantial countries or the substantial countries or the substantial countries.	key concepts and idectly analysing problems, le to carry out computed incepts and ideas by being problems, but with some and presentation or with key concepts and ideas plying the theorems throor computational errors. The problems is the problems of the problems in the	Examination Examination Examination as by being able to inclearly and elegantly properties of the p	Dec May dentify the appropriate resenting correct logical rectly, and with some propriate theorems an arguments, identifying onal errors. dentify appropriate theorems and arguments, identifying problems with poor appropriate theorems arguments with poor appropriate theorems arguments with poor appropriate theorems arguments with poor appropriate theorems arguments.	
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	Not for stu (MATH1851 statistics), o Y 1st set Y A+ to F A B C D Fail Lecture-bas	Demor theorer argume Demor but wi argume Demor applica	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of the sand their applications through corre- ting and argumentation and being abi- tive approaches to solving problems. Instrate a good understanding of key cor- topplications through correctly analysing propriate theorems or their applications instrate an acceptable understanding of the substantial inadequacies in applications through correctly analysing propriate theorems or their applications instrate an acceptable understanding of the substantial inadequacies in applying the or presentation or with substantial countries or the substantial	key concepts and idectly analysing problems, le to carry out computed incepts and ideas by being problems, but with some and presentation or with key concepts and ideas plying the theorems throor computational errors. Septs and ideas by being the theorems through the problems in the property of the problems in the problems.	Examination Examination Examination as by being able to inclearly and elegantly properties of the p	Dec May dentify the appropriate resenting correct logical rectly, and with some propriate theorems and arguments, identifying problems with poor or appropriate theorems with poor or appropriate theorems or the national errors.	
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	Not for stu (MATH1851 statistics), o Y 1st set Y A+ to F A B C D Fail Lecture-bas Activities	Demor theorer argume Demor but wi argume Demor applica	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of the sand their applications through corre- ting and argumentation and being abi- tive approaches to solving problems. Instrate a good understanding of key cor- topplications through correctly analysing propriate theorems or their applications instrate an acceptable understanding of the substantial inadequacies in applications through correctly analysing propriate theorems or their applications instrate an acceptable understanding of the substantial inadequacies in applying the or presentation or with substantial countries or the substantial	key concepts and idectly analysing problems, le to carry out computed incepts and ideas by being problems, but with some and presentation or with key concepts and ideas plying the theorems throor computational errors. Septs and ideas by being the theorems through the problems in the property of the problems in the problems.	Examination Examination Examination as by being able to inclearly and elegantly properties of the p	Dec May dentify the appropriate resenting correct logical rectly, and with some propriate theorems and arguments, identifying problems with poor appropriate theorems are propriate theorems and arguments, identifying problems with poor appropriate theorems are problems with poor appropriate theorems or the No. of Hour 3	
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching	Not for stu (MATH1851 statistics), o Y 1st set Y A+ to F A B C D Fail Lecture-bas Activities Lectures	Demor theorer argume Demor applicased coulderts I Calciur have em 2	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of ms and their applications through corre- ing and argumentation and being abl- tive approaches to solving problems. Instrate a good understanding of key cor- polications through correctly analysing propriate theorems or their applications sistrate an acceptable understanding of ms, but with some inadequacies in ap- ent and presentation or a number of mir instrate some understanding of key conc th substantial inadequacies in applyi- ent or presentation or with substantial co- sistrate poor and inadequate understa- tions, or not being able to complete the	key concepts and idectly analysing problems, le to carry out computed incepts and ideas by being problems, but with some and presentation or with key concepts and ideas plying the theorems throor computational errors. Septs and ideas by being the theorems through the problems in the property of the problems in the problems.	Examination Examination Examination as by being able to inclearly and elegantly properties of the p	Dec May dentify the appropriate esenting correct logice recetly, and with some propriate theorems an arguments, identifying and errors. ctly identify appropriate ing problems with poor appropriate theorems or the No. of Hours. 30 11	
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching & Learning Activities	Not for stu (MATH1851 statistics), o Y 1st set Y A+ to F A B C D Fail Lecture-bas Activities Lectures Tutorials	Demor theorer argume Demor applicased coulderts I Calciur have em 2	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of ms and their applications through corre- ing and argumentation and being abl- tive approaches to solving problems. Instrate a good understanding of key cor- polications through correctly analysing propriate theorems or their applications sistrate an acceptable understanding of ms, but with some inadequacies in ap- ent and presentation or a number of mir instrate some understanding of key conc th substantial inadequacies in applyi- ent or presentation or with substantial co- sistrate poor and inadequate understa- tions, or not being able to complete the	key concepts and idectly analysing problems, let to carry out compute the computation of	Examination Exami	Dec May dentify the appropriate esenting correct logice recetly, and with some propriate theorems an arguments, identifying and errors. ctly identify appropriating problems with poor appropriate theorems or the interest	
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching & Learning Activities	Not for stu (MATH1851 statistics), o Y 1st set Y A+ to F A B C D Fail Lecture-bas Activities Lectures Tutorials Reading / S	Demor theorer agume Demor argume Demor applica	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of the and their applications through correcting and argumentation and being able tive approaches to solving problems. Instrate a good understanding of key correctly analysing propriate theorems or their applications through correctly analysing propriate theorems or their applications that a acceptable understanding of the substantial inadequacies in applyient or presentation or a number of mir the strate some understanding of key conce the substantial inadequacies in applyient or presentation or with substantial constrate poor and inadequate understations, or not being able to complete the urse	key concepts and idectly analysing problems, le to carry out compute incepts and ideas by being problems, but with some and presentation or with key concepts and ideas plying the theorems thruston computational errors. The problems is a colution.	Examination as by being able to iclearly and elegantly provided by being able to identify the aperations carefully and control in adequacies in some minor computation by being able to correctly analysing the correctly analysing the correctly analysing able to identify appropriate to identify	Dec May Dec May dentify the appropriate esenting correct logice rrectly, and with some propriate theorems an arguments, identifying problems with poor appropriate theorems with poor appropriate theorems or the No. of Hours No. of Hours 100 essment Methods	
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching & Learning Activities	Not for stu (MATH1851 statistics), o Y 1st set Y A+ to F A B C D Fail Lecture-bas Activities Lectures Tutorials Reading / S Methods	Demor theorer reason innovar Demor theorer argume Demor but wir argume Demor applica sed courses Self students	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of the and their applications through correcting and argumentation and being able tive approaches to solving problems. Instrate a good understanding of key correctly analysing propriate theorems or their applications through correctly analysing propriate theorems or their applications that a acceptable understanding of the substantial inadequacies in applyient or presentation or a number of mir the strate some understanding of key conce the substantial inadequacies in applyient or presentation or with substantial constrate poor and inadequate understations, or not being able to complete the urse	key concepts and idectly analysing problems, let to carry out compute the computation of	Examination Exami	Dec May dentify the appropriate resenting correct logical propriate theorems and arguments, identifying a propriate theorems and arguments, identifying problems with poor and arguments are propriate theorems of the second propriate theorems or the second propriate theorems or the second propriate theorems or the second problems with poor and problems with poor and problems or the second problems or the second problems are theorems or the second problems with poor and problems with	
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Not for stu (MATH1851 statistics), o Y 1st set Y A+ to F A B C D Fail Lecture-bas Activities Lectures Tutorials Reading / S Methods Assignmen	Demor theorer reason innovar Demor theorer argume Demor but wir argume Demor applica sed courses Self students	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of the and their applications through correcting and argumentation and being able tive approaches to solving problems. Instrate a good understanding of key correctly analysing propriate theorems or their applications through correctly analysing propriate theorems or their applications that a acceptable understanding of the substantial inadequacies in applyient or presentation or a number of mir the strate some understanding of key conce the substantial inadequacies in applyient or presentation or with substantial constrate poor and inadequate understations, or not being able to complete the urse	key concepts and idectly analysing problems, let to carry out compute the computation of	Examination Exami	Dec May dentify the appropriate resenting correct logicarrectly, and with some propriate theorems and arguments, identifying problems with poor appropriate theorems or the second propriate theorems or the second propriate theorems or the second problems with poor appropriate theorems or the second problems with poor	
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type Course Teaching & Learning Activities	Not for stu (MATH1851 statistics), o Y 1st set Y A+ to F A B C D Fail Lecture-bas Activities Lectures Tutorials Reading / S Methods Assignment Examination Test Adrian Banr Press, 2007	Demor theorer argume Demor applicated Coulomber Self students I Calcular have em 2 Demor theorer argume Demor theorer argume Demor argume Demor applicated Coulomber I Self students I Self s	who have passed MATH18 ulus and ordinary differential e already enrolled in this course. Ind sem Instrate an excellent understanding of the and their applications through correcting and argumentation and being able tive approaches to solving problems. Instrate a good understanding of key correctly analysing propriate theorems or their applications through correctly analysing propriate theorems or their applications that a acceptable understanding of the substantial inadequacies in applyient or presentation or a number of mir the strate some understanding of key conce the substantial inadequacies in applyient or presentation or with substantial constrate poor and inadequate understations, or not being able to complete the urse	key concepts and idectly analysing problems, let to carry out computed incepts and ideas by being problems, but with some and presentation or with key concepts and ideas plying the theorems through the computational errors. The problems is and ideas by being the theorems through the computational errors. The problems is a constant of the constant	Examination Exami	Dec May dentify the appropriate esenting correct logics receive, and with some propriate theorems an arguments, identifying and errors. ctly identify appropriate ing problems with poor appropriate theorems or the No. of Hour No. of Hour No. of Hour 1. 10 essment Method to CLO Mapping 0.1,2,3,4,5,6	

MATH1641 Mathematical la	boratory	and m	odeling (6 credits)		Academic Year	2015
Offering Department	Mathema	thematics Quota				
Course Co-ordinator	TBC, Ma	thematic	es ()			
Teachers Involved	TBC, Ma	thematic	es			
Course Objectives	programr Biology, I	ning lar Ecology	oduces a powerful and free or guage will be taught via a r Statistics and Management. So be covered.	number of mathematic	al models in Physic	s, Chemistry
Course Contents & Topics	etc. Data	fitting	ry mathematical modeling, pre models and simulation of simp iation and integration of one va	ole random variable. R	andom walk models	
Course Learning Outcomes	On succe	essful co	mpletion of this course, student	ts should be able to:		
	CLO 1	recogn	ize the importance of numerical	methods in mathemati	cal modeling	
	CLO 2	demon	strate basic algebraic and arith	metic computations in the	ne Scilab environmer	nt
	CLO 3	write a	nd interpret programs in Scilab	programming language		
	CLO 4	solve s	imple numerical problems using	g interactive Scilab com	mands	
	CLO 5	solve n	noderately complicated numeric	cal problems by writing	Scilab programs	
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL					
Offer in 2015 - 2016	N				Examination	
Offer in 2016 - 2017	N					
Course Grade	A+ to F					
Grade Descriptors	A	Scilat	enstrate an excellent understanding of e environments and their applications at algorithms and being able to solve nu ome innovative approaches to solving	through correctly analysing pumerical problems by writing	problems, clearly and effi	ciently presenting
	В	enviro identi	nstrate a good understanding of key comments and their applications through instance the appropriate Scilab commanming/computational errors.	h correctly analysing proble	ms, but with some mino	r inadequacies ir
	С	appro	Instrate an acceptable understanding priate Scilab environments, but with eactly analysing problems with in amming/computational errors.	some inadequacies in solvin	g numerical problems wi	th Scilab through
	D	Scilat	onstrate some understanding of key control of the c	adequacies in solving numerio	cal problems with Scilab t	hrough incorrectly
	Fail		enstrate poor and inadequate understa applications, or not being able to compl		dentify appropriate Scilab	environments o
Course Type	Lecture-b	ased co	ourse			
Course Teaching	Activitie	es		Details		No. of Hours
& Learning Activities	Lectures	S				36
	Tutorials	S				12
	Reading	/ Self s	tudy			100
Assessment Methods and Weighting	Method	S	Details	Weighting in fi		nent Methods CLO Mapping
	Examina	ation			50	
	Test				50	
Required/recommended reading and online materials	F. R. Gi	ordano,	the course instructor. M. D. Weir, W. P. Fox: A finement of the finement of t	st course in mathema	tical modeling (Pac	fic Grove, C/

MATH1821 Mathematica	al methods for actuarial science I (6 credits)	Academic Year	2015
Offering Department	Mathematics	Quota	
Course Co-ordinator	Dr J T Chan, Mathematics (jtchan @hku.hk)		
Teachers Involved	Dr J T Chan, Mathematics		
Course Objectives	This course is the first of the two mathematics courses designed a solid background of calculus of one and several variables ar course focuses on single variable calculus and elementary mat Mathematics plus Module 1 or Core Mathematics plus Module 2 b	d an introduction to line ix theory. It aims at stu	ar algebra. The

Course Website	1 10.1		u.hk/course/MATH1821/				
Required/recommended reading and online materials	12th edition	า)	as; as revised by Maurice D. Vinear Algebra with Applications			as' Calculus	(Addison Wesley
	Test		2 tests		50	CLO 1	,2,3,4,5,6
	Examination	on			50		,2,3,4,5,6
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		sment Methods to CLO Mapping
	Reading /	Self st	udy	<u></u>			100
	Tutorials	٠. ١٠ ٠					12
	Lectures			-			36
Course Teaching & Learning Activities	Activities			Deta	ails		No. of Hours
Course Type Course Teaching	Lecture-bas		urse				
Course Type	Lootura k		ations, or not being able to complete the	e solutio	on.		
	Fail	argum	ent or presentation or with substantial constrate poor and inadequate underst	computa anding	tional errors. by not being able to id		
	D	Demoi	nstrate some understanding of key condith substantial inadequacies in applying	cepts ar	nd ideas by being able to c		
	С	theore	nstrate an acceptable understanding of ms, but with some inadequacies in ap- lent and presentation or a number of mi	plying	the theorems through inco		
	В	their a	nstrate a good understanding of key corpplications through correctly analysing propriate theorems or their applications	proble	ms, but with some minor in	nadequacies in a	rguments, identifying
Grade Descriptors	A	theore reason	nstrate an excellent understanding of ms and their applications through corre ning and argumentation and being ab tive approaches to solving problems.	ectly ana	alysing problems, clearly a	nd elegantly pres	enting correct logical
Course Grade	A+ to F						
Offer in 2016 - 2017	Υ						
Offer in 2015 - 2016	Y 1st s	sem			Exa	mination	Dec
re-requisites (and Co-requisites and mpermissible combinations)	Module 2, of Not for students ordinary difference of the control o	or equi idents fferenti these (who have passed MATH1013 al equations and MATH1853 L	3 Univ	ersity mathematics II	or (MATH18	351 Calculus and
Pre-requisites			nple first and second order ordin		•	o in HKDSE	Mathematics plus
	·		matrix and vector operations, co				
	CLO 4 ap	proxim	nate integrals by numerical meth	nods			
			dvanced rules/techniques of dif ; sketch graphs of functions	fferent	iation and integration	n to compute	derivatives and
	CLO 2 ev	/aluate	various kinds of limits, and dete	ermine	continuity and differen	entiability of fu	ınctions
			properties of a function and an				
Course Learning Outcomes	· ·		al equations. mpletion of this course, students	s shou	ıld be able to:		
	 - Mean valu - Bisection - Higher ord - Taylor apple - Improper - Numerica - Basic mate 	ue theomethoder der der proxim integral integral trix and	orem; implicit differentiation; L'H d and Newton's method. rivatives, maxima and minima, g ation and error estimation. als, partial fractions, integration l ration, Trapezoidal rule and Sim d vector (of orders 2 and 3) oper	raph s by par	sketching. ts. s rule.		
Course Contents & Topics			ns; inverse functions.				

MATH1851 Calculus ar	culus and ordinary differential equations (6 credits) Academic Year 2			
Offering Department	Mathematics	Quota	640	
Course Co-ordinator	Prof K M Tsang (1st sem); Dr Y K Lau (2nd sem), M yklau@maths.hku.hk)	athematics (kmtsang)	@maths.hku.hk;	
Teachers Involved	Prof K M Tsang (1st sem), Mathematics Dr Y K Lau (2nd sem), Mathematics Prof K W Chow (1st & 2nd sem), Mechanical Engineering Dr W Li (2nd sem), Mechanical Engineering			
Course Objectives	In this course, students will be introduced to fundamental concept equations with a view on applications in different engineering fields.			

	as some mathema	typical tical skil	e various engineering subjects vengineering applications, would in solving engineering problics required in different enginee	d be ems,	emphasized so and be well pre	that stude	nts could	enhan	ce their
Course Contents & Topics	- Ordinary - Laplace For m	ifferential and Integral Calculus (Single Variable) . Irdinary Differential Equations. aplace Transforms. In more information, please refer to http://hkumath.hku.hk/MathWWW/ucourse.ph ITH1851.description						se.php?	
Course Learning Outcomes	On succe	ssful cor	mpletion of this course, students	sho	uld be able to:				
			rate knowledge and understand s their relationship with some ty					ntial equ	uations
	CLO 2	apply ma	thematical skills to model and s	olve	some basic phys	ical/engine	ering prob	lems	
		nave a g	eneral grasp on the interrelation	n am	ong mathematica	I theory, re	sult and th	ne engir	neering
	CLO 4	oe well p	prepared to cope with a higheing disciplines	r lev	el of engineering	mathemat	ics requir	ed in d	ifferent
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	1ATH101	n Module 1, or Module 2 of HKI 1 University mathematics I clusively for Engineering studer		Mathematics or e	quivalent, c	r		
Offer in 2015 - 2016	Y 1st	, , , , , , , , , , , , , , , , , , , ,					on	Dec	May
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A 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.								
	С	theore	nstrate an acceptable understanding of ms and methods, but with some inade rgument and presentation or a number	quaci	es in applying them	through incorr			
	D	and m	nstrate some understanding of key concethods, but with substantial inadequace ent or presentation or with substantial c	ies in	applying them through				
	Fail		nstrate poor and inadequate understand opplications, and not being able to compl			entify appropri	ate theorem	s and me	thods or
Course Type	Lecture-b	ased cou	urse						
Course Teaching	Activitie	s		Det	tails			No. of	Hours
& Learning Activities	Lectures								36
	Tutorials								12
	Reading	/ Self stu	udy						100
Assessment Methods and Weighting	Methods	5	Details		Weighting in f		Assessr to	nent Me CLO Ma	
	Assignm	ents				10	CLO 1	,2,3,4	
	Examina	tion				70	CLO 1	,2,3,4	
	Test		2 tests			20	CLO 1	,2,3,4	
Required/recommended reading and online materials	G.B. Thor	mas, et a gle, et a	uction to Calculus and Differential.: Thomas' Calculus (Pearson III.: Fundamentals of Differenti	Educ	ation, 2005, 11th	ed.)	ılue Prob	lems (F	Pearsor
Course Website	http://hku	math.hkı	u.hk/course/MATH1851/						
Additional Course Information	Students	are not a	nake-up' for a missed test or as allowed to take MATH1851 and ered by the Department of Math	MĂT	H1853 together i	n the same	semester		

MATH1853 Linear alge	bra, probability and statistics (6 credits)	Academic Year	2015
Offering Department	Mathematics	Quota	640
Course Co-ordinator	Dr G Han, Mathematics (ghan @maths.hku.hk)		
Teachers Involved	Dr G Han (1st & 2nd sem), Mathematics Dr N Wong (1st sem), Electrical & Electronic Engineering Dr Y C Wu (2nd sem), Electrical & Electronic Engineering		
Course Objectives			

	commonl mathema concepts could be	as the consecutive course of MATH1851, students will be introduced to more topics of math- commonly applied in engineering so that students could be further enhanced with a concrete nathematics underpinned for different engineering subjects. The course emphasizes mathe concepts, principles, analysis, and their relationship to the modelling of engineering systems. Sould be furnished with the essential mathematical skill to analytically tackle some typical engineering to prepare for all the engineering subjects.						skill in ematical Students	
Course Contents & Topics	- Elemen - Basic P - Binomia - Samplir	tary Com robability al, Geome ng distribu nore	Matrix Algebra; Eigenvalues Proplex Variables. Laws; Random Variables, Probetric, and Poisson Distribution; Nation, Point Estimates and Confinformation, please refiption	oabili Norm idend	ty Distributions, E al Distribution.	·			se.php?
Course Learning Outcomes	On succe	essful cor	npletion of this course, students	sho	uld be able to:				
			rate knowledge and understand tionship to engineering problem			engineering	mathema	tics as	well as
			n engineering problem into a maraic equation, a differential equa						
		solve the learned	e model by selecting and apply	ying	a suitable mathe	ematical me	thod, ski	ll or ted	hnique
		have a go problem	eneral grasp on the interrelation	n am	ong mathematica	al theory, res	sult and t	he engii	neering
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in N	/ATH101	n Module 1, or Module 2 of HKI 1 University Mathematics I. clusively for Engineering studer		Mathematics or e	equivalent, o	r		
Offer in 2015 - 2016	Y 1s	t sem 2	nd sem			Examinati	on	Dec	May
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	В	theorer correct with so Demor method	astrate an excellent understanding of ms and methods and their applications logical reasoning and argumentation me innovative approaches to solving pure strate a good understanding of key cor ds and their applications through co- ents, identifying the appropriate theore	through and b roblem ncepts prectly	gh correctly analysing eing able to carry ou as. and ideas by being a analysing problem	g problems, cle ut computation able to identify ns, but with s	early and el s carefully the approp some mino	egantly prand corre	resenting octly, and rems and lacies in
	С	Demor	computational errors. Instrate an acceptable understanding of the sand methods, but with some inade regument and presentation or a number of the same increase.	equaci	es in applying them	through incorre			
	D	Demor	nstrate some understanding of key concethods, but with substantial inadequacent or presentation or with substantial c	cepts a	and ideas by being all applying them through	ble to correctly			
	Fail		nstrate poor and inadequate understand oplications, or not being able to complet			lentify appropri	ate theoren	ns and me	thods or
Course Type	Lecture-b	ased cou	ırse						
Course Teaching	Activitie	es		Det	ails			No. of	Hours
& Learning Activities	Lectures	3							36
	Tutorials	3							12
	Reading	/ Self stu	udy						100
Assessment Methods and Weighting	Method	s	Details		Weighting in f		Assessi	nent Mo	
	Assignm	nents				20	CLO 1	,2,3,4	
	Examina	ation				80	CLO 1	,2,3,4	
Required/recommended reading and online materials	S.J. Leor G. James C. Rorres	n: Linear A s, et al.: N s and H. A	Algebra and its Applications (Ada Algebra with Applications (Pear Modern Engineering Mathematic Anton: Applications of Linear Ala ced Engineering Mathematics (son E cs (Po gebra	Education, 2006, earson Educatior a (Wiley, 1984, 3	7th ed.) n, 2008, 4th	ed.)		
Course Website	http://hku	ımath.hku	u.hk/course/MATH1853/						
Additional Course Information	Students	are not a	nake-up' for a missed quiz or as allowed to take MATH1851 and ered by the Department of Math	MĂT	H1853 together i	n the same	semeste		

MATH2012 Fundamental concepts of mathematics (6 credits) Academic Year						
Offering Department	Mathematics	Quota				
Course Co-ordinator	Dr Y M Chan, Mathematics (ymchan@maths.hku.hk)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				

Teachers Involved		or Y M Chan, Mathematics or provide students with solid background on fundamental concepts of mathematics and methods of					
Course Objectives	mathemat	tical pro	nts with solid background on ofs. Such concepts and method matics. This course can be take	ds are important for su	ubsequent st	udies in all higher leve	
Course Contents & Topics	- Axiomati	nt calculatical prosecutions and fundinfinite numbers ic systermbers and the control of the cont	lus. oofs. nctions. e sets. and mathematical induction. ns in mathematics. and the limit of a sequence.				
Course Learning Outcomes	On succes	ssful cor	mpletion of this course, students	should be able to:			
	CLO 1	ındersta	nd the definition of a set and ap	ply set theory in simple	e daily life pro	oblems	
	CLO 2	construct	the truth table of a given stater	nent			
			erent proof strategies (e.g. prod natical statement	of by contradiction and	mathematica	al induction) in proving	
	CLO 4	demonst	rate the basic properties of equi	valence relations			
	CLO 5	ındersta	nd the definition of the limit of a	sequence of real numl	bers		
	CLO 6	demonst	rate the operational properties o	of groups			
Pre-requisites (and Co-requisites and Impermissible combinations)		1851 Ca	13 University mathematics II or alculus and ordinary differential				
Offer in 2015 - 2016	Y 1st	sem 2	2nd sem	I	Examination	Dec May	
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	В	theore reason innova Demor their a	nstrate an excellent understanding of ms and their applications through corre ing and argumentation and being ab tive approaches to solving problems. Instrate a good understanding of key cor pplications through correctly analysing	ctly analysing problems, cleated to carry out computation and cepts and ideas by being all problems, but with some m	arly and elegant ns carefully and ble to identify the inor inadequaci	tly presenting correct logical d correctly, and with some e appropriate theorems and es in arguments, identifying	
	С	Demor	propriate theorems or their applications instrate an acceptable understanding of ms, but with some inadequacies in ap- ent and presentation or a number of mir	key concepts and ideas by plying the theorems through	being able to d	correctly identify appropriate	
	D	Demor but wi	nstrate some understanding of key conc th substantial inadequacies in applyi ent or presentation or with substantial c	epts and ideas by being abling the theorems through			
	Fail		nstrate poor and inadequate understations, or not being able to complete the		to identify app	propriate theorems or their	
Course Type	Lecture-ba	ased co	urse				
Course Teaching & Learning Activities	Activitie	s		Details		No. of Hours	
α Learning Activities	Lectures					36	
	Tutorials					12	
	Reading	/ Self st	udy			100	
Assessment Methods and Weighting	Methods	•	Details	Weighting in fi		Assessment Methods to CLO Mapping	
	Assignme	ents	Tutorials and Assignments		10	CLO 1,2,3,4,5,6	
	Examina	tion			50	CLO 1,2,3,4,5,6	
					40	CLO 1,2,3,4,5,6	
	Test						
reading	Gary Cha		Albert D. Polimeni, Ping Zharson, 2012, Third Edition)	nang: Mathematical F	Proofs: A Ti	ransition to Advance	
Required/recommended reading and online materials Course Website	Gary Cha Mathemat	tics (Pea		nang: Mathematical F	Proofs: A Ti	ransition to Advance	
reading and online materials	Gary Cha Mathemat	math.hku	arson, 2012, Third Edition)				

MATH2014 Multivariable	e calculus and linear algebra (6 credits)	Academic Year	2015		
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					

			nts with a solid foundation in tudy of mathematics related s			les and linear	algebra, which they
Course Contents & Topics	interpretat - Partial I multipliers - Multiple I - Matrix Al - Vector independe - Eigenval - Numerica	Vectors and Matrices: Vectors in space, dot product and cross product, determinants (with geometric terpretations). Partial Derivatives: Functions of several variables, partial derivatives, extreme values and Lagrange autipliers, 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, linead dependence, 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 succes	sful co	impletion of this course, stude	nts sh	ould be able to:		
	CLO 1	0.1 understand the geometric meaning of partial and directional derivatives					
	CLO 2						
	CLO 3						
	CLO 4	under	stand the concept of vector sp	aces,	basis, dimension		
	CLO 5	solve	simple eigenvalue problems a	nd app	oly the theory to prac	ctical problems	3
Pre-requisites (and Co-requisites and Impermissible combinations)	and MATH Not for s ((MATH21	l1853 l tudent: 01 Lin	013 University mathematics II Linear algebra, probability and s who have passed MATH ear algebra I or MATH2102 I olled in these courses.	l statis 12822	tics). Mathematical metl	hods for actu	arial science II o
Offer in 2015 - 2016	Y 1st	sem	2nd sem		E	xamination	Dec May
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A B	Demo	onstrate an excellent understanding ems and their applications through coming and argumentation and being attive approaches to solving problems onstrate a good understanding of key applications through correctly analyz oppropriate theorems or their application onstrate an acceptable understanding onstrate an acceptable understanding onstrate.	concepting probons and	analyzing problems, clear carry out computations ts and ideas by being abl lems, but with some min presentation or with som concepts and ideas by b	rly and elegantly positive and collection in the anor inadequacies eminor computationing able to corrections.	presenting correct logical prectly, and with some oppropriate theorems and arguments, identifying onal errors.
	D	argun	ems, but with some inadequacies in nent and presentation or a number of onstrate some understanding of key o vith substantial inadequacies in ap	minor concepts	omputational errors. and ideas by being able	to correctly identi	fy appropriate theorems,
	Fail	Demo	nent or presentation or with substantion onstrate poor and inadequate under ations, or not being able to complete	erstandin	ng by not being able to	o identify approp	riate theorems or their
Course Type	Lecture-ba	sed co	ourse				
Course Teaching	Activities	3		De	etails		No. of Hours
& Learning Activities	Lectures						36
	Tutorials						12
	Reading /	Self s	tudy				100
Assessment Methods and Weighting	Methods		Details		Weighting in fin		essment Methods to CLO Mapping
	Examinat	ion			5	50 CL	O 1,2,3,4,5
	Test				5	50 CL	O 1,2,3,4,5
Required/recommended reading and online materials	TBC						

MATH2101 Linear algebra	I (6 credits)	Academic Year	2015				
Offering Department	Mathematics						
Course Co-ordinator	Dr K H Law, Mathematics (lawkaho@maths.hku.hk)						
Teachers Involved	Dr K H Law, Mathematics	Dr K H Law, Mathematics					
Course Objectives	This is a first university level course on linear algebra, which aims concept of linear structure through many concrete examples in the enriches students' exposure to mathematical rigor and prepares mathematical courses.	Euclidean spaces. T	he course also				
Course Contents & Topics	- Vector Geometry in R^2 and R^3: Revision of addition and scalar lines and planes; and applications to geometry.	multiplication of vector	ors, dot product,				

		•	Matrix addition and multiplicatio s a matrix equation.	n, de	terminant and inverse	of square r	natrices, system of	
	- Systems	s of Line	ar Equations: Gauss-Jordan el	imina	tion, 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, li	near inde	ependence, basis, dimension, a	pplica	ations.			
			mations: Definition and examp transformations.	les o	f linear transformatior	ns in R^2 a	and R^3, standard	
	- Eigenv	alue Pr	oblem: Eigenvalues and eig	jenve	ctors, diagonalization	of matri	ces (with distinct	
		eigenvalues), applications. Inner Product: Gram-Schmidt process, least square problems.						
Course Learning Outcomes	On succe	On successful completion of this course, students should be able to:						
	CLO 1 h	nandle m	atrix operations and use them in	n som	ne practical problems			
		solve sys	stems of linear equations by G atrices	auss	-Jordan elimination ar	nd also cor	mpute inverses of	
			nd the concept of vector sparthe matrix representations of sc			d linear tra	nsformations and	
	CLO 4	solve son	ne simple eigenvalue problems	and a	apply the theory to som	ne practical	problems	
	CLO 5	solve son	ne minimization problems by the	e leas	t squares method			
Pre-requisites (and Co-requisites and Impermissible combinations)		l1851 ca	3 University mathematics II or lculus and ordinary differential					
Offer in 2015 - 2016	Y 1st	sem 2	nd sem		Exam	ination	Dec May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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.							
					of key concepts and ideas by being able to correctly identify appropriate applying the theorems through incorrectly analysing problems with poor minor computational errors.			
				oncepts and ideas by being able to correctly identify appropriate theorems, plying the theorems through incorrectly analysing problems with poor al computational errors.				
	Fail		strate poor and inadequate understations, or not being able to complete the			ntify appropri	ate theorems or their	
Course Type	Lecture-b	ased cou	ırse					
Course Teaching	Activitie	s		Deta	ails		No. of Hours	
& Learning Activities	Lectures						36	
	Tutorials						12	
	Reading	/ Self stu	ıdy				100	
Assessment Methods and Weighting	Methods	5	Details		Weighting in final course grade (%)	Asse	essment Methods to CLO Mapping	
	Assignm	Assignments assignments, participation, etc		als,	10	CLC	0 1,2,3,4,5	
	Examina	tion			50	CLC	0 1,2,3,4,5	
	Test		2 tests		40	CLC	1,2,3,4,5	
Required/recommended reading and online materials	Spence, I	nsel & F	riedberg: Elementary Linear Alg	ebra	A Matrix Approach (Pearson, 20	014)	
Course Website	http://hkui	math hki	ı.hk/course/MATH2101/					
	http://hkumath.hku.hk/course/MATH2101/							

MATH2102 Linear algebra	a II (6 credits)	Academic Year	2015					
Offering Department	Mathematics							
Course Co-ordinator	Prof W Zang, Mathematics (wzang @maths.hku.hk)	Prof W Zang, Mathematics (wzang@maths.hku.hk)						
Teachers Involved	Prof W Zang, Mathematics	Prof W Zang, Mathematics						
Course Objectives	This is a follow up of the course Linear Algebra I. It aims at intro spaces, subspaces, dimensions, inner product spaces, etc. The could algebra for students' future study in mathematics and other discipline be drawn on different subject areas.	irse prepares the foun	dation on linea					
Course Contents & Topics	Vector spaces: definition of field, subspaces/quotient spaces, direct Linear transformations: kernel and image, isomorphisms							

	transformations, determinant 3. Linear operator: eigenvalues and eigenspaces, algebraic/geometric multiplicity, diagonalizability, Caley-Hamilton theorem, canonical form (optional) 4. Inner product space: Inner product, orthonormal basis, orthogonal complement and projection 5. Linear operators on inner product space: adjoints of operators, orthogonal/unitary oper orthogonal/unitary diagonalization of self-adjoint/normal operators, symmetric bilinear form and qua form 6. Additional selected topics up to the instructor								
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 identify vector space structures and apply relevant knowledge to some practical problems								
	CLO 2 und	erstand the notion of s	ubspaces and co	mpute basis, dimens	sion, etc				
		erstand the base-free ar transformations to the		•		the calculations of			
		able to solve eigenv	alue problem fo	r linear operators	and apply it	to the problem of			
		erstand the notions of blving properties of adjo		ace and adjoints of o	perators. Be a	ble to do calculation			
Pre-requisites (and Co-requisites and Impermissible combinations)		TH2101 Linear algebra Mathematical methods			ethods for act	uarial science I and			
Offer in 2015 - 2016	Y 2nd se	em		E	Examination	May			
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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 a their applications through correctly analysing problems, but with some minor inadequacies in arguments, identify 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 ap theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems or argument and presentation or a number of minor computational errors.							
		Demonstrate some understanding of key concepts and ideas by being able to correctly identify approbut with substantial inadequacies in applying the theorems through incorrectly analysing probargument or presentation or with substantial computational errors.							
Course Type	Lecture-base	ed course							
Course Teaching & Learning Activities	Activities		D	etails		No. of Hours			
& Learning Activities	Lectures					36			
	Tutorials					12			
	Reading / S	elf study				100			
Assessment Methods and Weighting	Methods	Details		Weighting in fir course grade (sessment Methods to CLO Mapping			
	Examination	ı			50 CL	_O 1,2,3,4,5			
	Test				50 CL	_O 1,2,3,4,5			
Required/recommended reading and online materials	S. Friedberg	, A. Insel, L. Spence: L	inear algebra (Pe	earson, 4th edition)					
Course Website	http://bkumo	th.hku.hk/course/MATH	12102/						

MATH2211 Multivariable of	alculus (6 credits)	Academic Year	2015
Offering Department	Mathematics	Quota	
Course Co-ordinator	Dr Z Hua (1st sem); Dr C W Wong (2nd sem), Mathe cwwongab@hku.hk)	ematics (huazheng@	@maths.hku.hk;
Teachers Involved	Dr Z Hua (1st sem), Mathematics Dr C W Wong (2nd sem), Mathematics		
Course Objectives	Students of this course will learn the theory of multivariable calculus solve practical problems. This is a required course for student Mathematics/Physics, and is suitable for all students majoring in sci finance and other students who will use multivariable calculus in their minor in Mathematics may take this course as one of the required course many mathematics courses of more advanced level.	ents majoring in M lences, engineering, e area of study. Studen	athematics or economics and its who want to
Course Contents & Topics	- Vectors: vectors in 2-, 3-, and n-dimensions; dot product and cro cylindrical, and spherical coordinates.	ss product; lines and	planes; polar,

Course Learning Outcomes	 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 del 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; Stoke's and Gauss' Theorems. On successful completion of this course, students should be able to: 							
		CLO 1 understand and demonstrate the basic theory of calculus of functions in several real variables CLO 2 evaluate partial derivatives and multiple integrals; compute line integrals and surface integrals						
			·					
			e knowledge to solve some s and other problems involving of					
Pre-requisites (and Co-requisites and Impermissible combinations)		H1851 Ca	13 University mathematics II or alculus and ordinary differential					
Offer in 2015 - 2016	Y 1s	t sem 2	2nd sem		Examination	Dec May		
Offer in 2016 - 2017	Υ					'		
Course Grade	A+ to F							
Grade Descriptors	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	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 appropria theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with polyagement and presentation or a number of minor computational errors.						
	D	D Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate the but with substantial inadequacies in applying the theorems through incorrectly analysing problems wargument or presentation or with substantial computational errors.						
	Fail		nstrate poor and inadequate understations, or not being able to complete the		to identify appro	ppriate theorems or their		
Course Type	Lecture-b	pased co	urse					
Course Teaching	Activitie	es		Details		No. of Hours		
& Learning Activities	Lectures	3				36		
	Tutorials	3				12		
	Reading	g / Self st	udy			100		
Assessment Methods and Weighting	Method	s	Details	Weighting in to		ssessment Methods to CLO Mapping		
	Assignm	nents			10	CLO 1,2,3		
	Examina	ation			50	CLO 1,2,3		
	Test				40	CLO 1,2,3		
Required/recommended reading and online materials	Susan J.	rest 40 CLO 1,2,3 usan J. Colley: Vector Calculus (Pearson, 2011, 4th edition)						
Course Website	http://hku	ımath.hkı	u.hk/course/MATH2211/					
Additional Course Information	Students	are assu	umed to have mastered calculus	of one-variable prior	to taking this co	ourse.		
				•				

MATH2241 Introduction to r	nathematical analysis (6 credits)	Academic Year	2015			
Offering Department	Mathematics Quota					
Course Co-ordinator	Dr B Kane (1st sem); Prof N Mok (2nd sem), Mathematics (bkane @ma	aths.hku.hk; nmok@h	ku.hk)			
Teachers Involved	Dr B Kane (1st sem), Mathematics Prof N Mok (2nd sem), Mathematics					
Course Objectives	To introduce students to the basic ideas and techniques of mathematical analysis.					
Course Contents & Topics	 The real number system: the real numbers as an ordered field, supre axiom, denseness of the rational numbers. Sequences and series of real numbers: limits of sequences, promonotone sequences and Cauchy sequences, subsequences, series, Continuity of real-valued functions: properties of continuous function intermediate value theorem, uniform continuity, limits of functions. Differentiation: properties of differentiable functions, the mean value. 	roperties of convergence ons, the extreme value	ent sequences, for series. ue theorem, the			

		ion: co	enstruction of the Riemann rem of calculus.	integral	using Darboux sums	s and Rie	emann sums, the		
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 c	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 convergent sequences/series							
			e important properties of conti mediate value theorem	inuous f	unctions such as the e	extreme v	alue theorem and		
	CLO 4 a	rticulate	e the construction of the Riema	ann integ	gral and its relation to d	ifferentiation	on		
Pre-requisites (and Co-requisites and Impermissible combinations)	and MAT actuarial s	Pass in MATH1013 University mathematics II or (MATH1851 Calculus and ordinary differential equations and MATH1853 Linear algebra, probability and statistics) or MATH2822 Mathematical methods for actuarial science II. Students are strongly recommended to have taken MATH2012 Fundamental concepts of mathematics if they wish to take this course.							
Offer in 2015 - 2016	Y 1st	sem 2	2nd sem		Examir	nation	Dec May		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	A Demonstrate a thorough mastery of the mathematical notions and proof techniques taught in the course by being able to handle abstract mathematical arguments, to apply appropriate theorems correctly, and to make use of those proof techniques in novel situations. Ability to present solutions clearly and logically, and the use of innovative ideas in solving problems are expected.							
	В	B Demonstrate a substantial command of the mathematical notions and proof techniques taught in the course by being able to handle abstract mathematical arguments, to apply appropriate theorems correctly, and, with guidance, to make use of those proof techniques in novel situations. Ability to present solutions clearly and logically, and evidence of innovative ideas in solving problems are expected.							
	С	Demonstrate a good understanding of the mathematical notions and proof techniques taught in the course by being able to handle abstract mathematical arguments and to apply appropriate theorems correctly. Ability to present solutions clearly and logically is expected.							
	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		nstrate poor and inadequate understa being able to apply the theorems corre		not being able to identify app	ropriate the	orems for applications,		
Course Type	Lecture-ba	ased co	urse						
Course Teaching	Activities	5		Deta	ils		No. of Hours		
& Learning Activities	Lectures						36		
	Tutorials						12		
	Reading	/ Self st	udy				100		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Asse	ssment Methods to CLO Mapping		
	Assignme	ents	Tutorials and Assignments		10	CL	O 1,2,3,4		
	Examinat	ion			50	CL	O 1,2,3,4		
	Test				40	CL	O 1,2,3,4		
Required/recommended reading and online materials			Donald R. Sherbert: Introduction Elementary Analysis: The The						
Course Website	http://hkur	nath.hk	u.hk/course/MATH2241/						

MATH2822 Mathematical m	nethods for actuarial science II (6 credits)	Academic Year	2015					
Offering Department	Mathematics Quota -							
Course Co-ordinator	Dr J T Chan, Mathematics (jtchan@hku.hk)							
Teachers Involved	Dr J T Chan, Mathematics	Dr J T Chan, Mathematics						
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 focuses 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 Outcomes	On successful completion of this course, students should be able to:							

	n	CLO 1 understand and recognize various topics in linear algebra such as the basic at matrices, determinants, systems of linear equations, eigenvalues and eigliagonalizable matrices, basis and dimension, and the rank-nullity theorem CLO 2 understand and recognize various topics in functions of several variables included differentiation, the Hessian test for local extrema, vector-valued functions, Jacobians, of Lagrange multipliers, double/triple integrals and the change of variable formula							
	d								
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in MATH1821 Mathematical methods for actuarial science I. For BSc(ActuarSc) students only.							
Offer in 2015 - 2016	Y 2nd	Y 2nd sem Examination May							
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	theore reasor	onstrate an excellent understanding ems and their applications through co ning and argumentation and being ative approaches to solving problems.	rrectly analysing problems, clea able to carry out computation	arly and elegantly p	resenting correct logical			
	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.								
					h incorrectly analys	sing problems with poor			
	D	Demo but w		minor computational errors. oncepts and ideas by being able being the theorems through	e to correctly identit	fy appropriate theorems,			
	D Fail	Demo but w argum	nent and presentation or a number of onstrate some understanding of key continued in appointment in appointment in appointment and appointmen	minor computational errors. concepts and ideas by being able blying the theorems through all computational errors. contact of the computation of	e to correctly identii incorrectly analysi	fy appropriate theorems, ng problems with poor			
Course Type		Demo but w argum Demo applica	nent and presentation or a number of onstrate some understanding of key count with substantial inadequacies in apprent or presentation or with substantial onstrate poor and inadequate under attions, or not being able to complete	minor computational errors. concepts and ideas by being able blying the theorems through all computational errors. contact of the computation of	e to correctly identii incorrectly analysi	fy appropriate theorems, ng problems with poor			
Course Teaching	Fail	Demo but w argum Demo applications	nent and presentation or a number of onstrate some understanding of key count with substantial inadequacies in apprent or presentation or with substantial onstrate poor and inadequate under attions, or not being able to complete	minor computational errors. concepts and ideas by being able blying the theorems through all computational errors. contact of the computation of	e to correctly identii incorrectly analysi	fy appropriate theorems, ng problems with poor			
••	Fail Lecture-ba	Demo but w argum Demo applica	nent and presentation or a number of onstrate some understanding of key count with substantial inadequacies in apprent or presentation or with substantial onstrate poor and inadequate under attions, or not being able to complete	minor computational errors. concepts and ideas by being able blying the theorems through il computational errors. restanding by not being able the solution.	e to correctly identii incorrectly analysi	fy appropriate theorems, ng problems with poor riate theorems or their			
Course Teaching	Fail Lecture-ba	Demo but w argum Demo applications	nent and presentation or a number of onstrate some understanding of key count with substantial inadequacies in apprent or presentation or with substantial onstrate poor and inadequate under attions, or not being able to complete	minor computational errors. concepts and ideas by being able blying the theorems through il computational errors. restanding by not being able the solution.	e to correctly identii incorrectly analysi	fy appropriate theorems, ng problems with poor riate theorems or their No. of Hours			
Course Teaching	Fail Lecture-ba Activities Lectures	argum Demo but w argum Demo applic assed co	nent and presentation or a number of onstrate some understanding of key or with substantial inadequacies in appeared to presentation or with substantial onstrate poor and inadequate under eations, or not being able to complete ourse	minor computational errors. concepts and ideas by being able blying the theorems through il computational errors. restanding by not being able the solution.	e to correctly identii incorrectly analysi	fy appropriate theorems, ng problems with poor riate theorems or their No. of Hours			
Course Teaching	Fail Lecture-ba Activities Lectures Tutorials	argum Demo but w argum Demo applic ased co	nent and presentation or a number of onstrate some understanding of key or with substantial inadequacies in appeared to presentation or with substantial onstrate poor and inadequate under eations, or not being able to complete ourse	minor computational errors. concepts and ideas by being able blying the theorems through il computational errors. restanding by not being able the solution.	e to correctly identii incorrectly analysii to identify approp	fy appropriate theorems, ng problems with poor riate theorems or their No. of Hours 36			
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials Reading	argum Demo but w argum Demo applica ased co	nent and presentation or a number of constrate some understanding of key continuous some understanding of key continuous some proposed in appearance or presentation or with substantial constrate poor and inadequate understations, or not being able to complete course	minor computational errors. Incepts and ideas by being able oblying the theorems through all computational errors. It is a stranding by not being able the solution. Details Weighting in fir course grade (e to correctly identiincorrectly analysis to identify approp	fy appropriate theorems, ng problems with poor riate theorems or their No. of Hours 36 12 100 sessment Methods			
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials Reading Methods	argum Demo but w argum Demo applica ased co	nent and presentation or a number of constrate some understanding of key continuous some understanding of key continuous some proposed in appearance or presentation or with substantial constrate poor and inadequate understations, or not being able to complete course	minor computational errors. concepts and ideas by being able oblying the theorems through it computational errors. cristanding by not being able the solution. Details Weighting in fir course grade (e to correctly identification incorrectly analysis to identify appropriate to identify appropriate to identify appropriate identify appropriate identification in the identifica	fy appropriate theorems, ng problems with poor riate theorems or their No. of Hours 36 12 100 sessment Methods to CLO Mapping			
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-ba Activities Lectures Tutorials Reading Methods Examinat Test George B 12th editio	argum Demo but w argum Demo applica ased co	nent and presentation or a number of constrate some understanding of key could be understanding or with substantial constrate poor and inadequate understanding, or not being able to complete course	minor computational errors. Incepts and ideas by being able oblying the theorems through of computational errors. It com	e to correctly identiincorrectly analysis to identify approp nal Ass %) 50 50 homas' Calculu	No. of Hours No. of Hours 100 100 100 100 100 100 100 1			

MATH3001 Development of	mather	atical ideas (6 credits)		Academic Year	2015			
Offering Department	Mathem	tics		Quota				
Course Co-ordinator	Prof W	Prof W K Ching, Mathematics (wching @hku.hk)						
Teachers Involved	TBC, M	BC, Mathematics						
Course Objectives	to gain provide	be acquaint the students with the origin and growth of basic mathematical concepts. To assist the student gain a deeper insight and broader view of mathematics as a discipline and human endeavour. To ovide the students with an opportunity to write on and talk about mathematics, and to engage dependent study.						
Course Contents & Topics	the stud	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 Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 understand and describe the origin and development of basic mathematical concepts							
	CLO 2 recognize and demonstrate the intellectual and the socio-cultural aspects of mathematics, and appreciate mathematics as both an academic discipline and a human endeavour							
	CLO 3 discuss, argue, and write about the development of various mathematical concepts and ideas							
	CLO 4 engage in independent study on a topic about the history or development of mathematics							
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in MATH2101 Linear algebra I, MATH2102 Linear algebra II, MATH2211 Multivariable calculus MATH2241 Introduction to mathematical analysis.						
Offer in 2015 - 2016	N			Examination				
Offer in 2016 - 2017	N							

Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough grasp of the subject. Show strong analytical and critical abilities and logical thinking, with evidence of 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	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.						
	D	·						
	Fail	lack o to dra	f analytical and critical abilitie	s, logical and of Make little or r	coherent thinking. Misuse of inforno meaningful contributions to cla	of the subject. Evidence of little or mation from sources and/or unable ass discussions. Organization and		
Course Type	Lecture-	based co	ourse					
Course Teaching	Activiti	Activities			Details No. of H			
& Learning Activities	Lecture	Lectures				36		
	Tutorial	Tutorials				12		
	Reading	g / Self st	tudy			100		
Assessment Methods and Weighting	Method	ls	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Examin	ation			50	CLO 1,2,3,4		
	Test				50	CLO 1,2,3,4		
Required/recommended reading and online materials	H. Eves (Holt, Re G. Polya R. Laube R. Calin C. Boyer	and C.V. einhart ar : How to enbacher ger (ed.): r: A Histo	nd Winston, 1958; 1990, Solve It (Princeton University) and D. Pengelley: Math Classic of Mathematics	3rd edition versity Pres- nematical E (Prentice I y, 1968; 19) s, 1971, 2nd edition) xpeditions (Springer-Verla Hall, preprinted 1995) 89, 2nd edition (with V.C. I	,		

MATH3002 Mathematics s	eminar (6	credits)		Academic Year	2015			
Offering Department	Mathemat	cs		Quota	12			
Course Co-ordinator	Prof T W	lg, Mathematics (nt	w@maths.hku.hk)	'	'			
Teachers Involved		of T W Ng, Mathematics of W S Cheung, Mathematics						
Course Objectives	mathemat then make prior to the	nis is a seminar style course intended for those who have very strong interests and good ability is athematics. Students will be given book chapters and elementary research articles for private study an en make presentations in front of the whole class. Individual meetings with the instructors will be arrange iror to their presentations. Active participation in all the discussions is expected. The aim of the course is to students learn how to initiate self/independent study in mathematics.						
Course Contents & Topics	Topics ch	sen by the instructo	ors, including chapters from b	ooks and elementary research a	rticles.			
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 Initiate private independent study on some interesting mathematical topics							
Pre-requisites (and Co-requisites and Impermissible combinations)	Multivaria	le calculus and MA	nental concepts of mathem TH2241 Introduction to mather r BSc students only.)	atics, MATH2101 Linear algeb ematical analysis.	ra I, MATH221			
Offer in 2015 - 2016	N			Examination				
Offer in 2016 - 2017	N							
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate thorough grasp of the subject. Show strong analytical and critical abilities and logical thinking, with evidence of original thought. Actively engage in and contribute substantially and fruitfully to class discussions. Apply highly effective organizational and presentational skills.							
	B 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.							
	C 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.							
	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. Contribute only in a limited way to fruitful and meaningful class discussions. Apply limited or barely effective organizational and presentational skills.							

	of analy	strate evidence of little or no grasp of the tical and critical abilities, logical and ons. Organization and presentational s	coheren	t thinking. Make little or no	meaning	
Course Type	Project-based cour	se				
Course Teaching & Learning Activities	Activities	Activities				No. of Hours
	Meeting with supe	Meeting with supervisor			meeting of the whole class for two hours each teaching week	
	Reading / Self stud	Reading / Self study			the	24
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	As	sessment Methods to CLO Mapping
	Research report	written examination coursework (70%)	(30%),	100		CLO 1
Additional Course Information	Enrollment needs in	nstructors' approval. This cours	e is for	second year BSc stude	nts onl	y.

MATH3301 Algebra I (6 cred	dits)				Academic	Year	2015
Offering Department	Mathemat	ics			Quota		
Course Co-ordinator	Dr Y K La	u, Mathe	ematics (yklau@maths.hku.hk)				
Teachers Involved	Dr Y K La	u, Mathe	ematics				
Course Objectives	application	nis course aims to present those fundamental topics and techniques of algebra that are finding w oplications in mathematics and the applied sciences. It is complete in itself, and may also be followed ATH4302 Algebra II and MATH7502 Topics in Applied Discrete Mathematics.					
Course Contents & Topics	group hon - Rings: e factorizati - Fields: d	Groups: examples of groups, subgroups, cosets, Lagrange theorem, quotient groups, normal subgroups roup homomorphisms, direct product of groups, group actions. Rings: examples of rings, integral domains, ideals, fields of fractions, principal ideal domains, uniquatorization domains. Fields: definition and examples of fields. Polynomials: polynomial rings in one variable over fields and over the integers.					
Course Learning Outcomes	On succes	ssful cor	npletion of this course, students	should be able to:			
	CLO 1	write do	own the precise definitions of the	e basic concepts in	the "Course C	Conents"	
	CLO 2	give ex	amples for each of the concepts	in the "Course Co	nents"		
	CLO 3	underst	and basic properties of groups,	rings, and fields			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	Pass in MATH2101 Linear algebra I.					
Offer in 2015 - 2016	Y 1st	sem			Examinati	on	Dec
Offer in 2016 - 2017	Υ				'		
Course Grade	A+ to F						
Grade Descriptors	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 poo 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 cou	ırse				
•	Activities			Details		No. of Hour	
Course Teaching	Activitie	5					NO. OI HOUI
Course Teaching	Activitie: Lectures	S					3
Course Teaching		S					
Course Teaching	Lectures		udy				3
Course Teaching & Learning Activities Assessment Methods	Lectures Tutorials	/ Self stu	udy Details	Weighting course gra			3
Course Teaching & Learning Activities Assessment Methods and Weighting	Lectures Tutorials Reading	/ Self stu				to	3 1 10 sment Method

	Test		40	CLO 1,2,3
Required/recommended reading and online materials	S. Lang: Underg J.B. Fraleigh: A I.N. Herstein: Ab	y the course instructor. raduate Algebra (Springer, 2004) First Course in Abstract Algebra (Add stract Algebra (Prentice-Hall, 1996) I: Abstract Algebra: An Introduction (S	,, ,	,
Course Website	http://hkumath.h	ku.hk/course/MATH3301/		

MATH3303 Matrix theory a	and its app	ilications (6 credits)		Academic Year	2015			
Offering Department	Mathema	tics		Quota				
Course Co-ordinator	Dr M You	ng, Mathematics (myoung@r	naths.hku.hk)					
Teachers Involved	TBC, Mat	hematics						
Course Objectives	analysis, science, matrix an	atrix theory has a close connection with other mathematical subjects such as linear algebra, functionallysis, and combinatorics. It also plays an important role in the development of many subjects in itence, engineering, and social sciences. In this course, students will be taught the fundamentals catrix analysis and its application to various kinds of practical problems. Mathematical software may be do in the course, so that students can learn how to use the computer to solve matrix problems.						
Course Contents & Topics	 Orthogo applicatio matrices: optimizati Singular 	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 oplications to over- or under-determined systems, least squares fit. Unitary, normal, and hermitia atrices: Schur's triangularization theorem. Variational description of eigenvalues: applications in otimization and in eigenvalue estimation. Singular value decomposition: polar decomposition, pseudo inverse, spectral norm of matrices, interlacing equalities for singular values. Jordan form and applications.						
Course Learning Outcomes	On succe	ssful completion of this cours	e, students should be able to:					
		nave a good understanding or	on matrices, determinants, linea	r transformations, e	eigenvalues and			
	CLO 2	CLO 2 understand the concept of similar matrices and the eigenvalue decomposition						
	CLO 3	CLO 3 understand the concept of orthogonality						
	CLO 4	CLO 4 understand the concept of unitary, normal, and Hermitian matrices						
		nd the singular value decomposition of a matrix and apply the theory of singular values to study olar decomposition, pseudo inverse and spectral norm of matrices						
		CLO 6 understand the concept of the Jordan blocks, Jordan matrices and the Jordan canonical form of matrix						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	Pass in MATH2101 Linear algebra I and MATH2102 Linear algebra II.						
Offer in 2015 - 2016	N			Examination				
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	Α	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 logica 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							
	Fail	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or the applications, or not being able to complete the solution.						
Course Type	Lecture-b	ased course						
Course Teaching	Activitie	S	Details		No. of Hour			
& Learning Activities	Lectures				3			
	Tutorials				1:			
		/ Self study			10			
Assessment Methods	Methods	•	Weighting in f		sment Method			
			course grade	(%) to	CLO Mapping			
			course grade	` '				
Assessment Methods and Weighting	Examina	tion	course grade	` '	2,3,4,5,6			

Required/recommended
reading
and online materials

Jack L. Goldberg: Matrix Theory with Applications (McGraw-Hill, 1991)
Steven J. Leon: Linear Algebra with Applications (Macmillan, 1994, 4th edition)
Chris Rorres & Howard Anton: Applications of Linear Algebra (Wiley, 1984, 3rd edition)
Roger A. Horn & Charles R. Johnson: Matrix Analysis (Cambridge University Press, 1987)
The Mathworks, Inc.: The Student Edition of Matlab (Version 4 for Microsoft Windows) (Prentice - Hall,

MATH3304 Introduction to	number theor	y (o credits)		cademic Year	2015			
Offering Department	Mathematics		Q	luota				
Course Co-ordinator	Prof K M Tsan	g, Mathematics (kmtsang@maths	s.hku.hk)					
Teachers Involved	Prof K M Tsan	g, Mathematics						
Course Objectives	congruences. multiplication. particularly inte and some of th	To provide students with basic concepts about numbers, their properties and the arithmetic congruences. The prime numbers are the basic building blocks of all the natural numbers und multiplication. The interplay between the multiplicative and additive properties of prime numbers particularly interesting. The course will study further properties and the distribution of the prime number and some of the longstanding open problems concerning them. Important applications of number theory modern cryptography will also be introduced.						
Course Contents & Topics	divisor, Euclide such as Chine theorem, quad - Many well-kn key cryptograp discussed. - Depending o	 The course will begin with some basic notions in number theory, including divisibility, greatest commo divisor, Euclidean algorithm, congruences, etc. It will then be followed by several fundamental theorems such as Chinese remainder theorem, solutions of linear and polynomial congruences, Fermat's Littl theorem, quadratic residues and the quadratic reciprocity law. Many well-known folklore open problems will also be introduced. Application of number theory to publikey cryptography will be explained. Basic properties and some research on the prime numbers will be discussed. Depending on the time remaining, the course will cover a selection of further topics, such as the prim number theorem, sum of squares, Dirichlet's theorem on diophantine approximations, etc. 						
Course Learning Outcomes	On successful	completion of this course, studen	ts should be able to:					
	CLO 1 solve	a system of linear congruences						
		polynomial congruences						
			ngruences by computation	n of Legendre syr	nbols			
	CLO 3 determine the solubility of quadratic congruences by computation of Legendre symbols CLO 4 determine the existence of primitive roots and use them in solving some exponential congruences							
	CLO 5 understand the prime number theorem							
	CLO 6 understanding some longstanding problems in number theory							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in MATH	2101 Linear algebra I and MATH2	2211 Multivariable calculu	S.				
Offer in 2015 - 2016	Y 2nd sem	1	E	xamination	May			
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	Demonstrate a thorough and coherent understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing number theoretic problems, clearly presenting correct logical reasoning and argumentation and being able to carry out computations carefully and correctly.							
	the	Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and their applications through correctly analysing number theoretic problems, but with some minor errors/inadequacies is arguments and being able to present coherent logical reasoning and carry out computations carefully without major errors.						
	C De	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropriat theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with wea and fragmentary argument and presentation, or with moderate computational errors.						
	the	eorems, but with some inadequacies in a	applying the theorems through i	ncorrectly analysing				
	D De the	eorems, but with some inadequacies in a	applying the theorems through it, or with moderate computations g of key concepts and ideas by it is in applying the theorems through	ncorrectly analysing pal errors. being able to correctly	problems with weak			
	D De the po	corems, but with some inadequacies in a d fragmentary argument and presentation emonstrate some superficial understanding corems, but with substantial inadequacie	applying the theorems through it, or with moderate computations g of key concepts and ideas by it is in applying the theorems thrustantial computational errors.	ncorrectly analysing palerrors. being able to correctly bugh incorrectly analymand ideas by not be	identify appropriate			
Course Type	D De the po	corems, but with some inadequacies in a d fragmentary argument and presentation emonstrate some superficial understanding sorems, but with substantial inadequacie or argument or presentation, or with substantial emonstrate poor and inadequate unders propriate theorems or their applications, or	applying the theorems through it, or with moderate computations g of key concepts and ideas by it is in applying the theorems thrustantial computational errors.	ncorrectly analysing palerrors. being able to correctly bugh incorrectly analymand ideas by not be	identify appropriate			
Course Teaching	D De the po Fail De ap	corems, but with some inadequacies in a d fragmentary argument and presentation emonstrate some superficial understanding sorems, but with substantial inadequacie or argument or presentation, or with substantial emonstrate poor and inadequate unders propriate theorems or their applications, or	applying the theorems through it, or with moderate computations g of key concepts and ideas by it is in applying the theorems thrustantial computational errors.	ncorrectly analysing palerrors. being able to correctly bugh incorrectly analymand ideas by not be	identify appropriate sing problems with			
Course Teaching	D De the po Fail De ap	corems, but with some inadequacies in a d fragmentary argument and presentation emonstrate some superficial understanding sorems, but with substantial inadequacie or argument or presentation, or with substantial emonstrate poor and inadequate unders propriate theorems or their applications, or	applying the theorems through it, or with moderate computations g of key concepts and ideas by it is in applying the theorems throtantial computational errors. Itanding of the key concepts are not being able to complete the	ncorrectly analysing palerrors. being able to correctly bugh incorrectly analymand ideas by not be	identify appropriate sing problems with weak identify appropriate sing problems with ing able to identify No. of Hours			
Course Teaching	D De the po Fail De ap Lecture-based Activities	corems, but with some inadequacies in a d fragmentary argument and presentation emonstrate some superficial understanding sorems, but with substantial inadequacie or argument or presentation, or with substantial emonstrate poor and inadequate unders propriate theorems or their applications, or	applying the theorems through it, or with moderate computations g of key concepts and ideas by it is in applying the theorems throtantial computational errors. Itanding of the key concepts are not being able to complete the	ncorrectly analysing palerrors. being able to correctly bugh incorrectly analymand ideas by not be	identify appropriate vising problems with weal identify appropriate vising problems with ing able to identify. No. of Hours			
Course Teaching	D De the po Fail De ap Lecture-based Activities Lectures	corems, but with some inadequacies in a difragmentary argument and presentation amonstrate some superficial understanding corems, but with substantial inadequacie or argument or presentation, or with substantial emonstrate poor and inadequate unders propriate theorems or their applications, of course	applying the theorems through it, or with moderate computations g of key concepts and ideas by it is in applying the theorems throtantial computational errors. Itanding of the key concepts are not being able to complete the	ncorrectly analysing palerrors. being able to correctly bugh incorrectly analymand ideas by not be	ridentify appropriate sing problems with weak identify appropriate sing problems with ing able to identify No. of Hours 36			
Course Teaching & Learning Activities Assessment Methods	D De the po Fail De ap Lecture-based Activities Lectures Tutorials	corems, but with some inadequacies in a difragmentary argument and presentation amonstrate some superficial understanding corems, but with substantial inadequacie or argument or presentation, or with substantial emonstrate poor and inadequate unders propriate theorems or their applications, of course	applying the theorems through it, or with moderate computations g of key concepts and ideas by it is in applying the theorems throtantial computational errors. Itanding of the key concepts are not being able to complete the	ncorrectly analysing all errors. Deing able to correctly bough incorrectly analysing and ideas by not be solution.	identify appropriate			
Course Teaching & Learning Activities Assessment Methods	D De the po Parish Properties Lectures Lectures Reading / Self	eorems, but with some inadequacies in a difragmentary argument and presentation emonstrate some superficial understanding eorems, but with substantial inadequacie or argument or presentation, or with substantial tradequacie error argument or presentation, or with substantial tradequate unders propriate theorems or their applications, or course	pplying the theorems through it, or with moderate computations g of key concepts and ideas by it is in applying the theorems threat the analysis of the key concepts at in not being able to complete the process of the	al Assess Assess Assess Assess Assess Assess Assess Assess	identify appropriate ving problems with weak ving problems with ing able to identify No. of Hours 12 100 5ment Methods			
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	D De the po	eorems, but with some inadequacies in a difragmentary argument and presentation emonstrate some superficial understanding eorems, but with substantial inadequacie or argument or presentation, or with substantial tradequacie error argument or presentation, or with substantial tradequate unders propriate theorems or their applications, or course	poplying the theorems through it, or with moderate computations go fixey concepts and ideas by its in applying the theorems threatnial computational errors. Itanding of the key concepts are not being able to complete the process. Details Weighting in fin course grade (9)	al Assess Assess CO CLO 1	No. of Hours No. of Hours 100 100 100 100 100 100 100 1			

Required/recommended reading and online materials	David M. Burton: Elementary Number Theory (McGraw-Hill Higher Education, International Edition). T.M. Apostol: Introduction to Analytic Number Theory (Springer International Student Edition). A. Baker: A Concise Introduction to the Theory of Numbers (Cambridge University Press, Cambridge).
Course Website	http://hkumath.hku.hk/course/MATH3304/

MATH2401 Analysis I (6 or	nditc\				Academic Year	2015		
MATH3401 Analysis I (6 cre	Mathema	tion						
Offering Department Course Co-ordinator			, Mathematics (wscheung@mai	the bku bk	Quota			
Teachers Involved			, Mathematics	ris.riku.rik)				
			•	como basia resulte	covered in Calcu	lus and introduce		
Course Objectives		nis course extends to more general situations some basic results covered in Calculus and introduce ome fundamental concepts which are essential for advanced studies in mathematical analysis.						
Course Contents & Topics	point; bot	Basic properties of metric spaces; openness; closedness; interior point; adherent point; accumulati oint; boundary point; compactness; completeness; continuity; connectedness; pathwise connectednes niform continuity; uniform convergence; Banach's fixed point theorem.						
Course Learning Outcomes	On succe	essful cor	mpletion of this course, students	should be able to:				
		CLO 1 demonstrate knowledge and understanding of the basic features of mathematical analysis are point set topology (e.g., able to identify objects that are topological equivalent)						
			owledge and skills acquired is in a critical way (e.g., able us)					
			eatively and laterally to generals (e.g., able to provide countered					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	Pass in MATH2211 Multivariable calculus.						
Offer in 2015 - 2016	Y 1st	t sem			Examination	Dec		
Offer in 2016 - 2017	Υ				1			
Course Grade	A+ to F							
Grade Descriptors	В	Demonstrate a thorough understanding of all concepts and ideas by being able to draw complex connections various concepts and apply the theorems through correctly analysing problems, clearly and elegantly pricorrect logical reasoning and argumentation, and with some innovative approaches to solving problems. Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theore their applications through correctly analysing problems, but with some minor inadequacies in arguments, re-						
	identifying the appropriate theorems, applications, or presentation. C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify theorems, but with some inadequacies in applying the theorems through incorrectly analysing proacceptable argument and presentation.							
	D							
	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or the applications, or not being able to complete the solution.							
Course Type	Lecture-b	pased co	urse					
Course Teaching	Activitie	es		Details No. o				
& Learning Activities	Lectures	3				3		
	Tutorials	3				1:		
	Reading	J / Self st	udy			10		
Assessment Methods and Weighting	Methods	S	Details		Weighting in final Asses			
	Examina	ation			50 C	O 1,2,3		
	Test				50 C	_O 1,2,3		
Required/recommended reading and online materials			atical Analysis of Mathematical Analysis					
Course Website	http://hku	ımath.hkı	u.hk/course/MATH3401/					

MATH3403 Functions of	Academic Year	2015					
Offering Department	Mathematics	Quota					
Course Co-ordinator	Prof T W Ng, Mathematics (ntw@maths.hku.hk)	Prof T W Ng, Mathematics (ntw@maths.hku.hk)					
Teachers Involved	Prof T W Ng, Mathematics	Prof T W Ng, Mathematics					
Course Objectives		This course is indispensable for studies in higher mathematical analysis and the more theoretical aspects of physics. In this course, the students are introduced to the fundamental concepts and properties of					

Course Website		h.hku.hk/course/MATH340	o /				
Required/recommended reading and online materials	L.V. Ahlfors: J. Bak & D.J.	rsh: The Theory of Functior Complex Analysis (McGraw Newman: Complex Analys ntroduction to Complex Ana	v-Hill, 3rd edi is, Undergra	duate Texts in Mathematic	s (Springe	r-Verlag)	
	Test			50	CLC	1,2,3,4	
	Examination			50	CLO	1,2,3,4	
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)		sment Methods to CLO Mapping	
	Reading / Se	elf study		1		100	
	Tutorials					12	
	Lectures					36	
Course Teaching & Learning Activities	Activities		De	Details		No. of Hours	
Course Type	Lecture-base	d course					
	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.						
	_ h	but with substantial inadequacies in applying the theorems through incorrectly analysing problems with polyagement or presentation or with substantial computational errors.					
	ti	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropria theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with polyagument and presentation or a number of minor computational errors.					
	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.						
Grade Descriptors	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.						
Course Grade	A+ to F						
Offer in 2016 - 2017	Υ						
Offer in 2015 - 2016	Y 1st ser	Y 1st sem			nation	Dec	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in MATI	H2211 Multivariable calculu	is and MATH	2241 Introduction to math	ematical ar	nalysis.	
		y such techniques to deterr ne real line	mine imprope	er integrals such as those	for certain	rational functions	
	CLO 3 com	pute contour integrals by ca	alculating res	idues			
		sp the techniques from Ca gral formulas to study analy				ion and Cauchy	
		ognize the theory of function	ns of a comp	lex variable as a rigorous	and found	ational subject in	
Course Learning Outcomes	On successfu	ul completion of this course,	, students sh	ould be able to:			
	- Analytic functions and elementary functions The Cauchy-Riemann equations Cauchy's theorem and its applications Taylor's series Laurent's series Zeros, singularities and poles The Residue Theorem and its applications.						
Course Contents & Topics		analytic functions and are shown how to look at analyticity from different points of view. At the same tim the techniques of solving problems without losing sight of the geometric picture are emphasized. - Complex number system.					

MATH3405 Differential equ	Academic Year	2015					
Offering Department	Mathematics Quota						
Course Co-ordinator	Dr C W Wong, Mathematics (cwwongab@hku.hk)						
Teachers Involved	Dr C W Wong, Mathematics						
Course Objectives	The standard topics in the wide field of ordinary differential equations (ODEs) included in this course are of importance to students of sciences and engineering. Our emphasis is on principles rather than routine calculations and our approach is a compromise between diversity and depth.						
Course Contents & Topics	 Review of elementary differential equations. Existence and uniqueness theorems. Second order differential equations, Wronskian, variation of parameters. Power series method, Legendre polynomials, Bessel functions. Linear systems, autonomous systems. 						

	- Qualitati		erties of solutions. nsform.					
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 solve simple first order and second order (linear or nonlinear) ODEs by various techniques, including auxiliary equations, variation of parameters, Laplace transform, and series method							
	CLO 2 solve systems of first order linear ODEs with constant coefficients, of which the number of equations and the number of unknown functions are no more than three							
	CLO 3 discuss qualitatively the solutions of nonlinear ODEs or systems of nonlinear ODEs by studying their linear approximations or their phase diagrams							
			theory of differential equations and life sciences	to study quantita	atively/qualita	tively prob	lems arising from	
Pre-requisites (and Co-requisites and Impermissible combinations)	calculus a	ass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH2014 Multivariable alculus and linear algebra) or (MATH1821 Mathematical methods for actuarial science I and MATH2822 athematical methods for actuarial science II).						
Offer in 2015 - 2016	Y 2nd	d sem			Examin	ation	May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F	A+ to F						
Grade Descriptors	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.							
	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.							
Course Type	Lecture-ba	ased co	urse					
Course Teaching	Activitie	s		Details	Details		No. of Hours	
& Learning Activities	Lectures						36	
	Tutorials						12	
	Reading	/ Self st	udy				100	
Assessment Methods and Weighting	Methods	S	Details		Weighting in final Ass course grade (%)		ssessment Methods to CLO Mapping	
	Examina	tion			50	CLC	0 1,2,3,4	
	Test				50	CLC	0 1,2,3,4	
Required/recommended reading and online materials	(Pearson, W.E. Boy Wiley, 6th	R. Nagle, E. Staff and A. Snider: Fundamentals of Differential Equations and Boundary Value Problems (Pearson, 6th edition) W.E. Boyce and R.C. DiPrima: Elementary Differential Equations and Boundary Value Problems (John Wiley, 6th edition) E.A. Coddington: An Introduction to Ordinary Differential Equations (Prentice-Hall)						
		-	· · · · · · · · · · · · · · · · · · ·	•	•			

MATH3408 Computational credits)	methods and differential equations with applications (6	Academic Year	2015					
Offering Department	Mathematics	Quota						
Course Co-ordinator	Dr C W Wong, Mathematics (cwwongab@hku.hk)	Dr C W Wong, Mathematics (cwwongab@hku.hk)						
Teachers Involved	Dr C W Wong, Mathematics Prof W K Ching, Mathematics							
Course Objectives	This course covers topics in the fields of differential equations and numerical analysis which are comportance to sciences students. The emphasis is practical applications of basic principles.							
Course Contents & Topics	 Numerical differentiation and integration. Solution of nonlinear systems of equations. Elementary differential equations. Power series method. Numerical solutions of ordinary and partial differential equations. Numerical solutions of systems of first-order ordinary differential eq 	uations.						
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 nonlinear system of equations							

	CLO 2	explain equation	mathematical ideas of numerions	cal methods in solv	ing ordinary	and partial differential		
	CLO 3	CLO 3 construct one-step and linear multistep methods for the numerical solution of initial-value problems for ordinary differential equations and systems of such equations and analyze their stability and accuracy properties						
	CLO 4	CLO 4 construct finite difference methods for the numerical solution of partial differential equations and analyze their stability and accuracy properties						
	CLO 5		ent numerical methods for soles like Scilab	ving initial and bou	ndary value	problems by software		
Pre-requisites (and Co-requisites and Impermissible combinations)	calculus	and line	101 Linear algebra I and MATH ear algebra) or (MATH1821 Matl ethods for actuarial science II).					
Offer in 2015 - 2016	Y 2	nd sem			Examinatio	n May		
Offer in 2016 - 2017	N	1						
Course Grade	A+ to F							
Grade Descriptors	A	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriate theorems and computational 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.						
	В	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and computational methods and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems and computational 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 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.						
	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems and computational methods or their applications, or not being able to complete the solution.							
Course Type	Lecture	-based co	ourse					
Course Teaching	Activit	ies		Details		No. of Hours		
& Learning Activities	Lecture	es				36		
	Tutoria	ıls				12		
	Readin	ng / Self s	tudy			100		
Assessment Methods and Weighting	Metho	ds	Details	Weighting in course grade		Assessment Methods to CLO Mapping		
	Examir	nation			50	CLO 1,2,3,4,5		
	Test				50	CLO 1,2,3,4,5		
Required/recommended			ntroduction to Applied Mathemat : An Introduction to Ordinary Diff			ringer)		
reading and online materials			P. Rabinowitz: A First Course in N					

	6 credits)	Academic Year	2015				
Mathem	atics	Quota					
Dr K H I	.aw, Mathematics (lawkaho@maths.hku.hk)	'					
Dr K H I	K H Law, Mathematics						
To intro	o introduce students to the basic ideas and techniques of discrete mathematics.						
generat - Graph	- Graph theory: paths, circuits, trees, connectivity, planarity, etc.						
On successful completion of this course, students should be able to:							
CLO 1 demonstrate knowledge and understanding of the basic ideas and techniques of discrete mathematics							
CLO 2 solve various real-world problems by using counting techniques and graph theory							
CLO 3 develop their ability to read, comprehend, and create mathematical arguments							
Pass in (MATH1013 University mathematics II and any 1 of Level 2 MATH courses) or (Nathurus and ordinary differential equations and MATH1853 Linear algebra, probability and state any 1 of level 2 MATH courses) or (MATH2014 Multivariable calculus and linear algebra) or (Nathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial s							
	Dr K H L To introc - Countingenerati - Graph - Applica On succ CLO 1 CLO 2 CLO 3 Pass in Calculus any 1 of	Dr K H Law, Mathematics (lawkaho@maths.hku.hk) Dr K H Law, Mathematics To introduce students to the basic ideas and techniques of discrete counting: combinations, permutations, pigeonhole principle, inclugenerating functions. Graph theory: paths, circuits, trees, connectivity, planarity, etc. Applications of counting techniques and graph theory. On successful completion of this course, students should be able to mathematics CLO 1 demonstrate knowledge and understanding of the bate mathematics CLO 2 solve various real-world problems by using counting technical develop their ability to read, comprehend, and create mathematics in (MATH1013 University mathematics II and any 1 of L Calculus and ordinary differential equations and MATH1853 Line any 1 of level 2 MATH courses) or (MATH2014 Multivariable calculus methods for actuarial science I and MATH2822 Mathematical methods	Dr K H Law, Mathematics (lawkaho@maths.hku.hk) Dr K H Law, Mathematics To introduce students to the basic ideas and techniques of discrete mathematics. - Counting: combinations, permutations, pigeonhole principle, inclusion-exclusion, recurrent generating functions. - Graph theory: paths, circuits, trees, connectivity, planarity, etc. - Applications of counting techniques and graph theory. On successful completion of this course, students should be able to: CLO 1 demonstrate knowledge and understanding of the basic ideas and techniques and techniques and graph theory. CLO 2 solve various real-world problems by using counting techniques and graph theory. CLO 3 develop their ability to read, comprehend, and create mathematical arguments Pass in (MATH1013 University mathematics II and any 1 of Level 2 MATH courses). Calculus and ordinary differential equations and MATH1853 Linear algebra, probability a any 1 of level 2 MATH courses) or (MATH2014 Multivariable calculus and linear algebra Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science I and M				

Offer in 2015 - 2016	Y 1st ser	m		Examir	nation	Dec		
Offer in 2016 - 2017	N							
Course Grade	A+ to F							
Grade Descriptors	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.							
	t	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.						
	t	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-base	d course						
Course Teaching & Learning Activities	Activities			ls		No. of Hours		
& Learning Activities	Lectures					36		
	Tutorials					12		
	Reading / Self study							
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)		sment Methods o CLO Mapping		
	Examination			50		CLO 1,2,3		
	Test			50	CLC	1,2,3		
Required/recommended reading and online materials	To be decide	d by the course instructor.						
Course Website	http://hkumat	h.hku.hk/course/MATH3600/						

MATH3601 Numerical anal	ysis (6 ci	euits)		Academic Year	2015				
Offering Department	Mathem	tics		Quota					
Course Co-ordinator	Dr Z Zha	ng, Mathematics (zhangzw@maths	hku.hk)						
Teachers Involved	Dr Z Zha	Z Zhang, Mathematics							
Course Objectives		his course covers both the theoretical and practical aspects of numerical analysis. Emphasis will be o asic principles and numerical methods of solution, using high speed computers.							
Course Contents & Topics	PolynoSolutioDirectNumer	Round off errors. Polynomial interpolation. Solution of equations of one variable. Direct and iterative methods for solving linear systems. Numerical differentiation and integration. Simple initial value problems.							
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1	CLO 1 construct and implement algorithms to find the zeros of functions, apply the bisection, Newton secant and fixed point iteration methods							
	CLO 2 construct and implement Newton's method to find the roots of a system of nonlinear equations								
	CLO 3 construct interpolation polynomials in Lagrange, Newton, Hermit and spline forms								
	CLO 4 apply the basic numerical integration and differentiation methods								
	CLO 5 solve initial value problems using Taylor series and Runge-Kutta methods of varying orders								
	CLO 6 use software package such as Scilab to solve numerical problems								
Pre-requisites (and Co-requisites and Impermissible combinations)	calculus	MATH2101 Linear algebra I and Mand linear algebra) or (MATH1821 I tical methods for actuarial science II	Mathematical methods for						
Offer in 2015 - 2016	Y 19	sem		Examination	Dec				
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	Demonstrate an excellent understandin- theorems/algorithms and their applicatio correct logical reasoning and argumental and with some innovative approaches to	ons through correctly analysing tion and being able to carry out r	problems, clearly and	elegantly presenting				
	В								

	th	Demonstrate a good understanding of key concepts and methods by being able to identify the applications through correctly analysing problems, but with some minor inade in arguments, identifying the appropriate algorithms or their applications or with some minor computational er						
	a	Demonstrate an acceptable understanding of key concepts and methods by being able to correctly identify appropriate theorems/algorithms, but with some inadequacies in applying the theorems/methods through incorrectly analysing problems with poor argument and presentation or with a number of minor computational errors. Demonstrate some understanding of key concepts and methods by being able to correctly identify appropriate theorems/algorithms, but with substantial inadequacies in applying the theorems/methods through incorrectly analysing problems with poor argument and presentation or with substantial computational errors. Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems/algorithms or their applications, or not being able to complete the solution.						
	tr							
Course Type	Lecture-based	Lecture-based course						
Course Teaching	Activities		Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials				12			
	Reading / Se	elf study			100			
Assessment Methods and Weighting	Methods	Details		ing in final grade (%)	Assessment Methods to CLO Mapping			
	Examination			50	CLO 1,2,3,4,5,6			
	Test			50	CLO 1,2,3,4,5,6			
Required/recommended reading and online materials	A. Ralston an	Instructor's Lecture Notes A. Ralston and P. Rabinowitz: A First Course in Numerical Analysis (McGraw-Hill) K. E. Atkinson: An Introduction to Numerical Analysis (Wiley, 1989)						
Course Website	http://hkumath	n.hku.hk/course/MATH3601/						

MATH3603 Probability theo	ory (6 cre	dits)	Academic Year	2015					
Offering Department	Mathem	atics	Quota						
Course Co-ordinator	Dr Z Qu	Mathematics (zhengqu@maths.hku.hk)							
Teachers Involved	Dr Z Qu	Mathematics							
Course Objectives	elucidate	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 tudents to apply what they have learned from this course to widely divergent concrete problems.							
Course Contents & Topics	distributi Bayes' T - Poisso concepts - Marko applicati	Basic probability theory and decision theory: discrete probability distributions, continuous probabil stributions, conditional probability, expectation, variance, moment generating function, limit theorem ayes' Theorem, decision analysis, decision tree method. Poisson process and reliability theory: exponential distribution, Markov property, Poisson process incepts of reliability, components in series, components in parallel, maintenance models. Markov chain theory: concepts of states and transition probability, irreducibility, stationary distribution polications in marketing and genetic problems, branching process, other Markov models. Inventory theory: concepts of EOQ, lead time effect, newsboy models, stochastic inventory systems.							
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 understand and recognize the fundamental principles of probability theory								
	CLO 2 explain the typical proofs and computational techniques in probability theory and apply them to concrete problems								
	CLO 3 demonstrate knowledge and understanding of various types of probability models								
Pre-requisites (and Co-requisites and Impermissible combinations)	calculus	Pass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH2014 Multivariable calculus) or (MATH2014 Multivariable calculus and linear algebra) or (MATH1821 Mathematical methods for actuarial science I and MATH282 Mathematical methods for actuarial science II).							
Offer in 2015 - 2016	Y 15	et sem	Examination	Dec					
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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	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	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 Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or their applications, or not being able to complete the solution.							
	Faii		able to identify appropriat	e theorems of their					

Course Teaching & Learning Activities	Activities Lectures Tutorials		Deta	ils	No. of Hours	
& Learning Activities					36	
					12	
	Reading / Self	study			100	
Assessment Methods and Weighting	Methods			Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Examination	ion		50	CLO 1,2,3	
	Test			50	CLO 1,2,3	
Required/recommended reading and online materials	S.M. Ross: Intro	oduction to Probability N	Models (Academi	c Press, 2007, 9th ed.)		
Course Website	http://hkumath.h	nku.hk/course/MATH36	03/			

MATH3901 Operations rese	earch I (6 cr	edits)			Aca	idemic Year	2015	
Offering Department	Mathematic	s			Quo	ota		
Course Co-ordinator	Dr Z Qu, Ma	athematics	(zhengqu@maths.hk	u.hk)				
Teachers Involved	Dr Z Qu, Ma	athematics						
Course Objectives	Programmir aspects of	The objective is to provide a fundamental account of the basic results and techniques of Linea Programming (LP) and its related topics in operations research. There is an equal emphasis on all three aspects of understanding, algorithms and applications. The course serves, together with a course or network models, as essential concept and background for more advanced studies in operations research.						
Course Contents & Topics	- Linear Pro - Matrix Gar - Goal Progr	ne.						
Course Learning Outcomes	On success	ful comple	tion of this course, stu	udents sho	ould be able to:			
		CLO 1 understand the fundamental concept and approach of linear programming appropriate to further study of operations research						
					of the underlying tech ex and dual Simplex a		Simplex Method	
		derstand a mes	nd apply the theory of	of LP dual	ity such as in the thed	ory and compu	tations of matrix	
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in MATH2014 Multivariable calculus and linear algebra or MATH2101 Linear algebra I or MATH210: Linear algebra II.						
Offer in 2015 - 2016	Y 2nd s	em			Exa	mination	May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify basic principles appropriate theorems, algorithms and their applications through correctly analysing problems, clearly and elegant presenting correct logical reasoning and argumentation and being able to carry out computations carefully an correctly, and to solve problems with some innovative approaches.						
	В	B Demonstrate a good understanding of key concepts and ideas by being able to identify basic principles, appro theorems, algorithms and their applications through correctly analysing problems, but with some minor inadeque in arguments, identifying the appropriate theorems or their applications and presentation or with some computational errors.						
	C Demonstrate an acceptable understanding of key concepts and ideas by being able to identify basic princip appropriate theorems, algorithms and their applications but with some inadequacies in applying the theorems thro						ne theorems through	
	D	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 Demonstrate poor and inadequate understanding by algorithms or their applications, or not being able to compare the state of the s						opropriate theorems	
Course Type	Lecture-bas	ed course						
Course Teaching & Learning Activities	Activities			De	Details No. of Ho			
	Lectures						36	
	Tutorials						12	
	Reading / Self study						100	
Assessment Methods and Weighting	Methods	Det	ails		Weighting in final course grade (%)		sment Methods o CLO Mapping	
	Examinatio	n			50	CLC	1,2,3	
	Test				50	CLC	1,2,3	

Required/recommended reading and online materials	J.P. Ignizio and T.M. Cavalier: Linear Programming (Prentice-Hall International, 1994) J.P. Ignizio: Goal Programming and Extensions (Lexington Books, 1976) H.A. Taha: Operations Research (Prentice-Hall International, 7/e 2003) P.R. Thie: An Introduction to Linear Programming and Game Theory (Wiley 2/e 1988) W.L. Winston: Introduction to Mathematical Programming (Duxbury 4/e 2003)
Course Website	http://hkumath.hku.hk/course/MATH3901/

MATH3904 Introduction to optimization (6 credits)						ic Year	2015		
Offering Department	Mathemat	ics			Quota				
Course Co-ordinator	Prof W Za	ing, Ma	hematics (wzang@maths.hku	.hk)					
Teachers Involved	Prof W Za	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	- Necessa	 - Unconstrained and constrained optimization. - Necessary conditions and sufficient conditions for optimality, convexity, duality. - Algorithms and numerical examples. 							
Course Learning Outcomes	On succes	On successful completion of this course, students should be able to:							
	CLO 1 c	lemonst	rate knowledge and understar	nding of the basic the	eory and tech	nniques o	foptimization		
	CLO 2 s	olve va	rious optimization problems en	countered in practic	е				
			and the connection between to behavior of algorithms for solvi		character o	f an optii	mization problem		
Pre-requisites (and Co-requisites and Impermissible combinations)	calculus a	ınd line	I01 Linear algebra I and MAT ar algebra) or (MATH1821 Ma thods for actuarial science II).						
Offer in 2015 - 2016	Y 2nd	l sem			Examina	tion	May		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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.							
	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								
Course Type	Lecture-ba	ased co	urse						
Course Teaching	Activitie	S		Details	Details		No. of Hours		
& Learning Activities	Lectures						36		
	Tutorials						12		
	Reading	/ Self st	udy				100		
Assessment Methods and Weighting	T		Details	Weighting i	in final	Asses	amant Mathada		
and Weighting	Methods	,	Details	course gra					
and Weighting	Methods Examina		Details			1			
and Weighting			Details		ide (%)	CL	to CLO Mapping		
and Weighting Required/recommended reading and online materials	Examina	tion			50	CL			

MATH3905 Queueing th	Academic Year	2015	
Offering Department	Mathematics		
Course Co-ordinator	Dr Z Zhang, Mathematics (zhangzw@maths.hku.hk)		
Teachers Involved	Dr Z Zhang, Mathematics		
Course Objectives	This course introduces students to the models and theory of queue simulation as a practical tool of analysis.	ing system, as well as	the technique of

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. 							
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1	understa	nd the terminology and nomeno	lature appropriate to	queueing theo	ry		
	CLO 2	demonstrate knowledge and understanding of various queueing models						
	CLO 3	O 3 formulate concrete problems using queueing theoretical approaches						
	CLO 4	become technique	familiar with fundamental prires	nciples of simulation	and compare	e different simulation		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH2014 Multivariable calculus and linear algebra) or (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II).							
Offer in 2015 - 2016	Y 2r	nd sem			Examination	May		
Offer in 2016 - 2017	N							
Course Grade	A+ to F							
Grade Descriptors	A	and the	Demonstrate an excellent understanding of key concepts and ideas by being able to identify 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 to solve problems with some innovative approaches.					
	В	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.						
	С	theore	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	but wi	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate theorem but with substantial inadequacies in applying the theorems through incorrectly analysing problems with polyagement 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-	based co	urse					
Course Teaching	Activiti	es		Details		No. of Hours		
& Learning Activities	Lecture	S				36		
	Tutorial	s				12		
	Reading	g / Self st	udy			100		
Assessment Methods and Weighting	Method	ls	Details	Weighting in t		ssessment Methods to CLO Mapping		
	Examin	ation			50	CLO 1,2,3,4		
	Test				50	CLO 1,2,3,4		
Required/recommended reading and online materials	S.M. Ros	ss: Introd	oduction to Queueing Theory (E uction to Probability Models (Ac urse in Simulation (Macmillan, 19	ademic Press, 1993,				
Course Website			u.hk/course/MATH3905/	,				

MATH3906 Financial calcu	Academic Year	2015						
Offering Department	Mathem	atics	Quota					
Course Co-ordinator	Dr S P	Dr S P Yung, Mathematics (spyung@hku.hk)						
Teachers Involved	Dr S P Yung, Mathematics							
Course Objectives	market	This course gives an elementary treatment for the modeling of financial derivatives, asset pricing and market risks from an applied mathematician's point of view. Stochastic calculus and solution methods will be introduced.						
Course Contents & Topics	contract - Asset Lemma	roduction to financial instruments: stocks, bonds, foreign ess. pricing: risk neutral relationship, no arbitrage principle. Brown Black-Scholes model and its pricing partial differential equations on the Black-Scholes model: American options, path dep	vnian motion, stochast	ic calculus, Ito's				
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 understand the terminology and nature of bonds, interest rates, forwards, futures, stocks, options, and the no-arbitrage-principle							
	CLO 2 demonstrate knowledge on using binomial tree models to find option prices via the risk-neutral concept							
	CLO 3	describe basic properties of a Brownian motion and the Blad	ck-Scholes stock price	model				
	CLO 4							

	implement stochastic calculus (such as Ito's Lemma) to derive Black-Scholes pricing partial differential equation on various type of options; and find a solution to this partial differential equation							
Pre-requisites (and Co-requisites and Impermissible combinations)	calculus ar	Pass in (MATH2101 Linear algebra I and MATH2211 Multivariable calculus) or (MATH2014 Multivariable calculus and linear algebra) or (MATH1821 Mathematical methods for actuarial science I and MATH2822 Mathematical methods for actuarial science II) or STAT2601 Probability and statistics I.						
Offer in 2015 - 2016	Y 1st s	Y 1st sem Examination Dec						
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	theore	nstrate an excellent understand ms and their applications throug ing and argumentation and be tive approaches to solving proble	n correctly a ing able to	analysing problems, clea	arly and elegantly	presenting correct logical	
	В	their a	nstrate a good understanding of pplications through correctly and propriate theorems or their applic	alysing prob	olems, but with some mi	nor inadequacies	in arguments, identifying	
	С	theore	nstrate an acceptable understan ms, but with some inadequacie ent and presentation or a numbe	s in applyir	ng the theorems through			
	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		nstrate poor and inadequate uations, or not being able to comp			to identify approp	oriate theorems or their	
Course Type	Lecture-ba	sed co	urse					
	Activities D							
Course Teaching	Activities			De	etails		No. of Hours	
Course Teaching & Learning Activities	Activities Lectures			De	etails		No. of Hours	
				De	etails			
	Lectures		udy	De	etails		36	
	Lectures Tutorials		udy Details	De	Weighting in fir		36 12	
& Learning Activities Assessment Methods	Lectures Tutorials Reading /	Self stu	1	De	Weighting in fir course grade (%)	36 12 100 sessment Methods	
& Learning Activities Assessment Methods	Lectures Tutorials Reading / Methods	Self stu	1	De	Weighting in fir course grade (%) 50 C	36 12 100 sessment Methods to CLO Mapping	
& Learning Activities Assessment Methods	Lectures Tutorials Reading / Methods Examinating Test A. Etheridg M. Baxter in Press, 199 P. Wilmott Press, 199	on Je: A Co and A. 6) , S. Ho 5)	1	s (Cambr us: An In	Weighting in fir course grade (*) idge University Prestroduction to Derivanatics of Financial	50 C 50 C ss) attive Pricing (C Derivatives (C	36 12 100 sessment Methods to CLO Mapping ELO 1,2,3,4 ELO 1,2,3,4 Cambridge University	

MATH3911 Game theory ar	nd strate	gy (6 credits)	Academic Year	2015				
Offering Department	Mathem	atics	Quota					
Course Co-ordinator	Dr K H I	Or K H Law, Mathematics (lawkaho@maths.hku.hk)						
Teachers Involved	Dr K H I	K H Law, Mathematics						
Course Objectives		name theory is the logical analysis of situations of conflict and cooperation. This course will introduce the tudents to the basic ideas and techniques of mathematical game theory in an interdisciplinary context.						
Course Contents & Topics	theorem - Application - Application	Combinatorial games and Zermelo's Theorem; Prisonner's Dilemma; pure and mixed strategies, minimal leorem; mixed Nash equilibria. Application to biology: evolutionary stable strategies; games in coalition form; Shapley value. Application to politics: Shapley-Shubik power index; core and von Neumann-Morgenstern solution argaining set.						
Course Learning Outcomes	On succ	essful completion of this course, students should be able to	D:					
	CLO 1	understand the basic terminology and solution concepts in	game theory					
	CLO 2	CLO 2 compute explicitly different solution concepts for some simple cooperative and non-cooperative games						
	CLO 3 apply game theoretical ideas and methods to solve some problems in economics and biology							
Pre-requisites (and Co-requisites and Impermissible combinations)		(MATH2101 Linear algebra I and MATH2211 Multivariable s for actuarial science I and MATH2822 Mathematical meth						
Offer in 2015 - 2016	Y 2	nd sem	Examination	May				
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	Α							

	ap	emonstrate an excellent understanding of k propriate theorems and their applications to prrect logical reasoning and being able to ca proaches to solving problems.	hrough correctly analysing problem	ns, clearly and elegantly presenting		
	ap in	emonstrate a good understanding of key propriate theorems and their applications the arguments, identifying the appropriate the amputational errors.	rough correctly analysing problems,	, but with some minor inadequacies		
	ide	Demonstrate an acceptable understanding of key concepts and ideas of Game Theory by being able to corre identify appropriate theorems, but with some inadequacies in applying the theorems through incorrectly analys problems with poor argument and presentation or a number of minor computational errors. Demonstrate some understanding of key concepts and ideas of Game Theory by being able to correctly idea appropriate theorems, but with substantial inadequacies in applying the theorems through incorrectly analys problems with poor argument or presentation or with substantial computational errors.				
	ap					
		emonstrate poor and inadequate understa oplications, or not being able to complete the		tify appropriate theorems or their		
Course Type	Lecture-based	course				
Course Teaching & Learning Activities	Activities		Details	No. of Hours		
& Learning Activities	Lectures			36		
	Tutorials			12		
	Reading / Sel	If study		100		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments	assignments, tuto participation etc	orials, 5	CLO 1,2,3		
	Examination		50	CLO 1,2,3		
	Project report	ts	20	CLO 1,2,3		
	Test		25	CLO 1,2,3		
Required/recommended reading and online materials	L.C. Thomas:	Games, Theory and Applications (E	Pover Publications, 1993)			
Course Website	http://hkumath	.hku.hk/course/MATH3911/				

MATH3943 Network model	s in ope	rations research (6 credits)	Academic Year	2015				
Offering Department	Mathem	1000						
Course Co-ordinator	Prof W	Prof W Zang, Mathematics (wzang@maths.hku.hk)						
Teachers Involved	TBC, M	TBC, Mathematics						
Course Objectives	operation applicat	The objective is to provide a fundamental account of the basic results and techniques of network models in operations research. There is an equal emphasis on all three aspects of understanding, algorithms and applications. The course serves, together with a course on linear programming, to provide essential concept and background for more advanced studies in operations research.						
Course Contents & Topics	- Trees, - Netwo - Ford- algorithm	s and algorithms. matchings and paths. rk models of transportation and assignment problems. Fulkerson network flow theory and computation for ms. ations to combinatorial optimization problems such as allot t networks, if time permits.						
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 understand the fundamental concept and approach of graphs and network models appropriate to the further study of operations research							
	CLO 2 demonstrate knowledge and understanding of the underlying techniques of the various graph and network algorithms and their extensions							
	CLO 3 understand the theory of network flows and the duality aspects in such methods of flow computations							
Pre-requisites (and Co-requisites and Impermissible combinations)	(MATH2	(MATH2101 Linear algebra I and MATH2211 Multivariabl 2014 Multivariable calculus and linear algebra); and MATH3901 Operations research I, or already enrolled in	,					
Offer in 2015 - 2016	N		Examination					
Offer in 2016 - 2017	Υ		'					
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify basic principles, appropriate 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.							
	В	Demonstrate a good understanding of key concepts and ideas by theorems, algorithms and their applications through correctly ana						

		in arguments, identifying the appropriate theorems or their applications and presentation or with some minor computational errors.					
	a	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.					
	th	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, appropriat algorithms or their applications, or not being able to complete or compute the solution.					
Course Type	Lecture-based	d course					
Course Teaching & Learning Activities	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			
	Test		50	CLO 1,2,3			
Required/recommended reading and online materials	R.K. Ahuja, T.	, J.J. Jarvis and H.D. Sheral: Linea .L. Magnanti and J.L. Orlin: Networ perations Research: an Introductior	k Flows: Theory Algorithms, ar				

MATTIOSSS DIFFCIER STUR	ies in ma	thematics (6 credits)	Academic Year	2015				
Offering Department	Mathema	tics	Quota					
Course Co-ordinator	Prof W K	Ching, Mathematics (wching @hku.hk)						
Teachers Involved	All teachi	ng staff, Mathematics						
Course Objectives		This course is designed for students who would like to have early experiences on research related independent studies.						
Course Contents & Topics	The stud	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 Outcomes	On succe	essful completion of this course, students should be able to:						
	CLO 1	study independently a topic that is not available in the regula	ar curriculum					
	CLO 2	understand how mathematical theories are applied and/or ex	xtended in problem-so	olving				
	CLO 3	gain experience in project writing and oral presentation						
Pre-requisites (and Co-requisites and Impermissible combinations)	MATH4X MATH21 Introducti	at least 24 credits of advanced level disciplinary core/elect XX or MATH7XXX) in the Mathematics, and Mathematics/F01 Linear algebra I, MATH2102 Linear algebra II, MATH221 on to mathematical analysis.	Physics Majors, in ad-	dition to a pass i				
	This caps	o approval by the Department. stone course is for Mathematics, and Mathematics/Physics M est that a student is allowed to take this capstone course is th	,					
Offer in 2015 - 2016	This caps	stone course is for Mathematics, and Mathematics/Physics M	,	No Exam				
	This caps	stone course is for Mathematics, and Mathematics/Physics M est that a student is allowed to take this capstone course is the	eir year 3 study.	No Exam				
Offer in 2016 - 2017	This caps The earli	stone course is for Mathematics, and Mathematics/Physics M est that a student is allowed to take this capstone course is the	eir year 3 study.	No Exam				
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	This caps The earli Y 1s	stone course is for Mathematics, and Mathematics/Physics M est that a student is allowed to take this capstone course is the	Examination Examination and critical abilities and rmation drawn from a broad	logical thinking, with				
Offer in 2016 - 2017 Course Grade	This caps The earlie Y 1s Y A+ to F	betone course is for Mathematics, and Mathematics/Physics Mest that a student is allowed to take this capstone course is the sem. 2nd sem. Demonstrate thorough grasp of the subject. Show strong analytical evidence of original thought. Insightful use and critical evaluation of info sources and to reference aptly. Critical use of data and results to draw.	eir year 3 study. Examination and critical abilities and rmation drawn from a broad wappropriate and insight discritical abilities and logicangful comparisons between	logical thinking, with drange of high quality ful conclusions. Apply al thinking. Critical use n different secondary				
Offer in 2016 - 2017 Course Grade	This caps The earli Y 1s Y A+ to F	Demonstrate thorough grasp of the subject. Show strong analytical evidence of original thought. Insightful use and critical evaluation of info sources and to reference aptly. Critical use of data and results to dra highly effective organizational and presentational skills. Demonstrate substantial grasp of the subject. Evidence of analytical and relevant information from sources, showing ability to make meani interpretations and to reference aptly. Correct use of data of results to	eir year 3 study. Examination and critical abilities and rmation drawn from a broatiew appropriate and insight diritical abilities and logicangful comparisons between odraw appropriate conclusions and appropriate conclusions appropriate con	logical thinking, with d range of high quality ful conclusions. Apply all thinking. Critical use n different secondary sions. Apply effective all abilities and logical ifferent interpretations				
Offer in 2016 - 2017 Course Grade	This caps The earlie Y 1s Y A+ to F A B	Demonstrate thorough grasp of the subject. Show strong analytical evidence of original thought. Insightful use and critical evaluation of info sources and to reference aptly. Critical use of data and results to dra highly effective organizational and presentational skills. Demonstrate substantial grasp of the subject. Evidence of analytical an of relevant information from sources, showing ability to make meani interpretations and to reference aptly. Correct use of data of results to organizational and presentational skills. Demonstrate general but incomplete grasp of the subject. Evidence of thinking. Use of relevant information from sources, showing ability to make meani and to reference aptly. Mostly correct use of data of results to organizational and presentational skills.	eir year 3 study. Examination and critical abilities and rmation drawn from a broatiew appropriate and insight direction of the state	logical thinking, with drange of high quality ful conclusions. Apply all thinking. Critical use in different secondary sions. Apply effective all abilities and logical ifferent interpretations or				
Offer in 2016 - 2017 Course Grade	This caps The earli Y 1s Y A+ to F A B	Demonstrate thorough grasp of the subject. Show strong analytical evidence of original thought. Insightful use and critical evaluation of info sources and to reference aptly. Critical use of data and results to dra highly effective organizational and presentational skills. Demonstrate substantial grasp of the subject. Evidence of analytical and of relevant information from sources, showing ability to make meani interpretations and to reference aptly. Correct use of data of results organizational and presentational skills. Demonstrate general but incomplete grasp of the subject. Evidence of thinking. Use of relevant information from sources, showing ability to make meani and to reference aptly. Mostly correct but some erroneous use of da Apply moderately effective organizational and presentational skills. Demonstrate partial but limited grasp, with retention of some relevant coherent and logical thinking, but with limited analytical and critical abis sources, but mainly through summary rather than analysis and compa	eir year 3 study. Examination and critical abilities and rmation drawn from a broad aw appropriate and insight de critical abilities and logical angful comparisons betwee to draw appropriate conclusive comparisons between data and results to draw appropriate information, of the subject information, of the subject information, and presentational sk tanding of the subject. Evid of secondary sources and	logical thinking, with drange of high qualit ful conclusions. Apply all thinking. Critical use in different secondary sions. Apply effective all abilities and logical ifferent interpretations propriate conclusions of the c				

Course Teaching	Activities	Activities				No. of Hours
& Learning Activities	Reading / Self s	study		independent work & to attend meetings & seminars		100
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	As	ssessment Methods to CLO Mapping
	Dissertation	Written report plus of presentation	oral	100	(CLO 1,2,3

MATH4302 Algebra II (6 cr	edits)				Ac	cademic Year	2015		
Offering Department	Mathemat	ics			Qı	uota			
Course Co-ordinator	Prof J H L	of J H Lu, Mathematics (jhlu@maths.hku.hk)							
Teachers Involved	Prof J H L	of J H Lu, Mathematics is course is an extension of MATH3301 Algebra I and goes deeper into the various topics treated in							
Course Objectives	course. To	This course is an extension of MATH3301 Algebra I and goes deeper into the various topics treated in the course. Together, the two courses are complete in themselves, and may be followed by MATH7501 Topin Algebra and MATH7502 Topics in Applied Discrete Mathematics.							
Course Contents & Topics	generated	abeliar	em for finitely generated modu n groups and canonical forms of s; elements of Galois theory.			mains, with app	lications to finitel		
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 understand the classification of finitely generated abelian groups and certain canonical forms of matrices								
	CLO 2 u	ndersta	and and compute splitting fields	of irre	educible polynomials	S			
	CLO 3 c	ompute	examples of Galois groups						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M.	ATH33	01 Algebra I.						
Offer in 2015 - 2016	Y 2nd	sem			Ex	camination	May		
Offer in 2016 - 2017	Υ				'				
Course Grade	A+ to F								
Grade Descriptors	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 poo 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		nstrate poor and inadequate understations, or not being able to complete the			identify appropria	te theorems or their		
Course Type	Lecture-ba	ased co	urse						
Course Teaching	Activities	s		Def	tails		No. of Hours		
& Learning Activities	Lectures						36		
	Tutorials						12		
	Reading	/ Self st	udy				100		
Assessment Methods and Weighting	Methods		Details	<u>'</u>	Weighting in fina course grade (%		ssment Methods to CLO Mapping		
	Assignme	ents			1	0 CL	O 1,2,3		
	Examinat	tion			5	50 CL	O 1,2,3		
	Test				4	10 CL	O 1,2,3		
Required/recommended reading and online materials	J.B. Fralei I.N. Herste N. Jacobs	gh: A Fein: Top on: Bas	Abstract Algebra: An Introducti irst Course in Abstract Algebra oics in Algebra (Wiley, 1975) iic Algebra (Freeman, 1974) aduate Algebra (Springer, 1996	(Addi			2nd ed.)		

ATH4402 Analysis II (6 credits) Academic Year 2015	IATH4402 Analysis II (6 credits)	Academic Year	2015	
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Offering Department	Mathemat	tics			Quota				
Course Co-ordinator	Dr M Your	ng, Math	nematics (myoung@maths.hku	.hk)		<u>"</u>			
Teachers Involved	Dr M Your	M Young, Mathematics							
Course Objectives	treatment	This course gives a comprehensive and rigorous treatment on calculus of several variables, and a moder reatment of integration theory in the language of differential forms which is essential for more advance tudies in analysis and geometry.							
Course Contents & Topics	function the method of a lintegration of a lintegration of the method in	Differentiation of functions of several variables: partial derivatives, differential, differentiability, inveuenction theorem, implicit function theorem, free extremum problems, constrained extremum problems, constrained extremum problems, constrained extremum problems, constrained extremum problems, and the constrained extremum problems, and content zero sets, integrability, Fubini's Theorems, artition of unity, change of variables. Integration on chains: tensors, alternating tensors, vector fields, differential forms, Poincare Lemmostokes' Theorem.							
Course Learning Outcomes	On succes	ssful cor	mpletion of this course, student	s should be able to:					
			rate knowledge and understar metry (e.g., able to manipulate		language of I	mathematical analysis			
	s		nowledge and skills acquired is in a critical way (e.g., able to						
			atively and laterally to generat on of specific functions on chair		to novel prob	olems (e.g., able to do			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	Pass in MATH3401 Analysis I.							
Offer in 2015 - 2016	Y 2nd	d sem			Examination	May			
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	В	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. 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		nstrate poor and inadequate unders ations, or not being able to complete the		e to identify app	propriate theorems or the			
Course Type	Lecture-ba	ased co	urse						
Course Teaching	Activities	s		Details		No. of Hours			
& Learning Activities	Lectures					36			
	Tutorials					1:			
	Reading	/ Self st	udy			100			
Assessment Methods and Weighting	Methods	•	Details	Weighting in course grade		Assessment Method to CLO Mapping			
	Examinat	tion			50	CLO 1,2,3			
	Test				50	CLO 1,2,3			
D		est 50 CLO 1,2,3 costol: Mathematical Analysis unkres: Analysis on Manifolds udin: Principles of Mathematical Analysis							
Required/recommended reading and online materials	Munkres: Rudin: Pri	Analysis nciples	s on Manifolds						

MATH4404 Functional anal	TH4404 Functional analysis (6 credits) Academic Year			
Offering Department	Mathematics Quota			
Course Co-ordinator	Dr J T Chan, Mathematics (jtchan@hku.hk)			
Teachers Involved	Dr J T Chan, Mathematics			
Course Objectives	This course introduces students to the basic knowledge of linear funct modern analysis.	ional analysis, an imp	ortant branch of	
Course Contents & Topics	- Metric spaces: Open and closed sets. Convergent sequences. Comp - Normed spaces, Banach spaces: Finite dimensional normed space		empactness and	

	- Inner sequence Special operator - Funda Category	product ses, serie polynomics. Immental to the product	Bounded linear operators. Non spaces, Hilbert spaces: Orthos related to orthonormal sets ials. Riesz's representation theorems for normed and Ban, uniform boundedness principof linear operators.	ogona and neorer	il complements, d sequences. Total m. Adjoint operato spaces: Hahn-Ba	irect sums orthonorm or, self-adjo anach theo	. Orthoral sets pint, nor em. R	and sequences. rmal and unitary eflexive spaces.
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1	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 completeness and discuss how vectors are represented in these spaces						
	CLO 2	CLO 2 understand the notions of Banach spaces and Hilbert Spaces. State and apply fundament theorems in these spaces						
	CLO 3	discuss	the dual spaces of some stand	lard Ba	anach spaces			
	CLO 4	discuss	the boundedness of linear ope	rators	and the spectra of	f special line	ear ope	rators
	CLO 5	apply fur	nctional analysis to the study o	f diffe	rential equations a	nd optimiza	ition pro	blems
Pre-requisites (and Co-requisites and Impermissible combinations)			01 Linear algebra I, MATH210 duction to mathematical analys				ultivaria	ble calculus and
Offer in 2015 - 2016	Y 2r	2nd sem Examination				n	May	
Offer in 2016 - 2017	Y							
Course Grade	A+ to F							
Grade Descriptors	В	theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logi reasoning and argumentation and being able to carry out computations carefully and correctly, and with so innovative approaches to solving problems.					enting correct logical ctly, and with some	
	their applications through correctly analy the appropriate theorems or their applica			lysing problems, but with some minor inadequacies in arguments, identifying ations and presentation or with some minor computational errors.				guments, identifying errors.
				ing of key concepts and ideas by being able to correctly identify appropriate in applying the theorems through incorrectly analysing problems with poo of minor computational errors.				
				concepts and ideas by being able to correctly identify appropriate theorems applying the theorems through incorrectly analysing problems with pootatal 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-	based co	urse					
Course Teaching	Activiti	es		De	etails			No. of Hours
& Learning Activities	Lecture	s						36
	Tutorial	s						12
	Reading	g / Self st	udy					100
Assessment Methods and Weighting	Method	ls	Details		Weighting in fii course grade (sment Methods o CLO Mapping
	Examin	ation				50	CLO 1	,2,3,4,5
	Test					50	CLO 1	,2,3,4,5
Required/recommended reading and online materials	Erwin Kr	eyszig: Ir	ntroductory Functional Analysis	s with	Applications (John	-Wiley and	Sons, 1	1978)

MATH4406 Introduction to	partial differential equations (6 credits)	Academic Year	2015					
Offering Department	Mathematics	Quota						
Course Co-ordinator	Dr H Y Zhang, Mathematics (hyzhang@maths.hku.hk)							
Teachers Involved	Dr H Y Zhang, Mathematics	Dr H Y Zhang, Mathematics						
Course Objectives	This course introduces students to the basic techniques for solving partial differential equations as well as the underlying theories.							
Course Contents & Topics	 - Laplace, heat and wave equations. Classification of partial different value and eigenvalue problems. Separation of variables, Fourier Duhamel's principle, characteristic method. - Green's function, generalized functions and fundamental solutions. - Maximum principle, existence, uniqueness and continuous dependent of time permits Cauchy-Kowalevski theorem, variational method, non 	series, linearity ar	nd superposition					
Course Learning Outcomes	On successful completion of this course, students should be able to:							

		CLO 1 apply the tools of calculus, linear algebra, mathematical analysis in a coherent way to PDE problems							
	CLO 2 ur	CLO 2 understand the basic theory of partial differential equations and the methods to solve them							
	CLO 3 ap	oply the kr	nowledge of partial di	fferential ed	quations to physical scie	ences and en	gineering		
Pre-requisites (and Co-requisites and Impermissible combinations	analysis; a	ass in MATH2101 Linear algebra I, MATH2102 Linear algebra II, MATH2241 Introduction to mathematica nalysis; and ass in MATH3405 Differential equations, or already enrolled in this course.							
Offer in 2015 - 2016	Y 2nd	2nd sem Examination May							
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	theorems reasoning	and their applications thro	ough correctly being able to	y concepts and ideas by b analysing problems, clearly a co carry out computations ca	nd elegantly pre	senting correct logical		
	В								
	С	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	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		ate poor and inadequatens, or not being able to co		ng by not being able to idution.	entify appropria	te theorems or their		
Course Type	Lecture-ba	sed cours	е						
Course Teaching	Activities	.		D	etails		No. of Hours		
& Learning Activities	Lectures						36		
	Tutorials						12		
	Reading /	Self study	,				100		
Assessment Methods and Weighting	Methods	D	etails		Weighting in final course grade (%)		ssment Methods to CLO Mapping		
	Examinati	on			50	CL	O 1,2,3		
	Test				50	CL	.O 1,2,3		
Required/recommended reading and online materials	D. Bleecke	r & G. Sco	ordas: Basic Partial [Differential E	duction, 2nd ed. (Wiley) Equations (International Mathematical Society)				
Course Website	http://hkum	ath hku h	k/course/MATH4406	1					

MATH4501 Geometry (6 cre	edits)		Academic Year	2015				
Offering Department	Mathematic	cs	Quota					
Course Co-ordinator	Dr J Fullwo	ood, Mathematics (fullwood@maths.hku.hk)						
Teachers Involved	Dr J Fullwo	or J Fullwood, Mathematics						
Course Objectives	universe in training in 3-space. In	tric forms often appear in nature, the study of geomethic which we live. Moreover, geometry has much intrinsic be intuitive thinking. In this course we study the different the study of regular surfaces in 3-space we exhibit geor properties of these surfaces alone, leading to the intrinsi	peauty and the study of ial geometry of curves metric notions that are o	it is an excellen and surfaces ir definable in terms				
Course Contents & Topics		d space curves, regular surfaces in three-dimensional Euss map, Gaussian and mean curvatures, Gauss's Theore		Sonnet Theorem.				
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 understand the fundamental theorems on curves							
	CLO 2	compute the Gaussian and mean curvatures						
	CLO 3	understand the basics of intrinsic geometry of surface	es					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in MA	TH2101 Linear algebra I and MATH3401 Analysis I.						
Offer in 2015 - 2016	Y 1st s	em	Examination	Dec				
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate an excellent understanding of key concepts and in theorems and their applications through correctly analysing problem						

		reasoning and argumentation and being able to carry out computations carefully and correctly, 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	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		rate poor and inadequate understons, or not being able to complete the	anding by not being able to ident esolution.	ify appropriate theorems or their			
Course Type	Lecture-b	ased cours	se					
Course Teaching	Activities		Details	No. of Hours				
& Learning Activities	Lectures			36				
	Tutorials				12			
	Reading / Self study				100			
Assessment Methods and Weighting	Methods	s D	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	M P Do C	Carmo: Diffe	erential Geometry of Curves a	and Surfaces (Prentice-Hall, 1	976)			
Course Website	http://hkui	math.hku.h	nk/course/MATH4501/					

	unierenna	able manifolds (6 credits)	Academic Year	2015				
Offering Department	Mathema	tics	Quota					
Course Co-ordinator	Prof J H L	.u, Mathematics (jhlu@maths.hku.hk)						
Teachers Involved	Prof J H L	u, Mathematics						
Course Objectives	tools for distributio	The course aims at introducing students to the notion of differentiable manifolds and basic concepts bols for their study, such as differential forms, exterior differentiation and integration; vector full listributions, and integrability; and covariant differentiation through affine connections. The course tims at presenting concrete examples that are relevant to further fields of study.						
Course Contents & Topics	- Different - Maps be - Integrati - The tang	riew on functions of several variables, inverse mapping theorem, implicit function theorem. erentiable manifolds: definitions and examples. os between manifolds, submanifolds. Differential forms and exterior differentiation. gration on manifolds. at tangent bundle, distributions and Frobenius Theorem. there topics.						
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 understand the basic language and concepts of modern differential geometry with examples							
	CLO 2	apply the knowledge of algebra and analysis learned previ	ously to solve geometr	ric problems				
Pre-requisites (and Co-requisites and Impermissible combinations)		1ATH3401 Analysis I (having taken MATH4501 Geometry concurrently with MATH4402 Analysis II).	would be helpful; the	course can al				
		Y 2nd sem Examination May						
Offer in 2015 - 2016	Y 2nd	d sem	Examination	May				
	Y 2nd	i sem	Examination	May				
Offer in 2016 - 2017		d sem	Examination	May				
Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	N	Demonstrate an excellent understanding of key concepts and id theorems and their applications through correctly analysing problems reasoning and argumentation and being able to carry out computinnovative approaches to solving problems.	leas by being able to iders, clearly and elegantly pres	ntify the appropriat				
Offer in 2016 - 2017 Course Grade	N A+ to F	Demonstrate an excellent understanding of key concepts and id theorems and their applications through correctly analysing problems reasoning and argumentation and being able to carry out compu	leas by being able to ider s, clearly and elegantly pres tations carefully and corre ing able to identify the approne me minor inadequacies in a	ntify the appropriat enting correct logic ctly, and with som opriate theorems an rguments, identifyin				
Offer in 2016 - 2017 Course Grade	N A+ to F	Demonstrate an excellent understanding of key concepts and id theorems and their applications through correctly analysing problems reasoning and argumentation and being able to carry out computinnovative approaches to solving problems. Demonstrate a good understanding of key concepts and ideas by being their applications through correctly analysing problems, but with sor	leas by being able to ider s, clearly and elegantly pres stations carefully and corre ing able to identify the appro me minor inadequacies in a th some minor computationa as by being able to correctly irrough incorrectly analysing	ntify the appropriate enting correct logic ctty, and with som propriate theorems an rguments, identifyin all errors.				
Offer in 2016 - 2017 Course Grade	N A+ to F	Demonstrate an excellent understanding of key concepts and id theorems and their applications through correctly analysing problems reasoning and argumentation and being able to carry out computinnovative approaches to solving problems. Demonstrate a good understanding of key concepts and ideas by be their applications through correctly analysing problems, but with sor the appropriate theorems or their applications and presentation or wit Demonstrate an acceptable understanding of key concepts and idea theorems, but with some inadequacies in applying the theorems the	leas by being able to ider s, clearly and elegantly pres stations carefully and corre ing able to identify the appro- ne minor inadequacies in a h some minor computationa as by being able to correctly arough incorrectly analysing s. g able to correctly identify a	ntify the appropriate theorems an appropriate theorems an arguments, identifyin all errors. I dentify appropriate problems with poor				
Offer in 2016 - 2017 Course Grade	N A+ to F A B C	Demonstrate an excellent understanding of key concepts and id theorems and their applications through correctly analysing problems reasoning and argumentation and being able to carry out computinnovative approaches to solving problems. Demonstrate a good understanding of key concepts and ideas by beitheir applications through correctly analysing problems, but with some the appropriate theorems or their applications and presentation or with the properties of	leas by being able to ider s, clearly and elegantly pres tations carefully and corre ting able to identify the appro me minor inadequacies in a th some minor computationa as by being able to correctly arrough incorrectly analysing s. g able to correctly identify a ugh incorrectly analysing	ntify the appropriat enting correct logica ctly, and with some opriate theorems and guments, identifyin al errors. I dentify appropriat problems with poor				

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
	Test		50	CLO 1,2
Required/recommended reading and online materials	2003) W. Boothby: Ar 2nd Ed.)		ntroduction to Differential Manifo nifolds and Riemannian Geome (Springer, 2002)	,
Course Website	http://hkumath.h	nku.hk/course/MATH4511/		

MATH4602 Scientific com	puting (6 cre	edits)		Ac	cademic Year	2015	
Offering Department	Mathematic	CS		Qı	uota		
Course Co-ordinator	Prof W K C	hing, Mathematics (wching@	Dhku.hk)				
Teachers Involved	TBC, Mathe	ematics					
Course Objectives		e introduces mathematical t putation problems that are of					
Course Contents & Topics	Neumann Gershgorin - Some sel	on to scientific computing, series, iterative methods, 's Theorem. ected topics: multigrid methot t squares, singular values, etc.	eigenvalues, ods, projection	power method, spen methods, recursion	ectral radius, So methods, fast F	chur's Theorem	
Course Learning Outcomes	On success	sful completion of this course	e, students she	ould be able to:			
	CLO 1	apply direct method in solv	ving a linear s	ystem			
	CLO 2	analyze the complexity of	a numerical a	lgorithm			
	CLO 3	give a proof for Schur's Th	eorem and G	ershgorin's Theorem			
	CLO 4	apply iterative methods in	solving a linea	ar system			
	CLO 5	compute the singular value	es of a matrix				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in MA	TH3601 Numerical analysis.					
Offer in 2015 - 2016	N			E	kamination		
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	Α	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriat theorems and numerical 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 with some innovative approaches to solving problems.					
	В	B Demonstrate a good understanding of key concepts and ideas by being able to identify the appropriate theorems and numerical algorithms and their applications through correctly analysing problems, but with some minor inadequacies in arguments, identifying the appropriate theorems and numerical algorithms or their applications and presentation o with some minor computational errors.					
	С	Demonstrate an acceptable unde theorems and numerical algorith problems with poor argument and	ms, but with so	me inadequacies in apply	ying them through ir		
	D	Demonstrate some understanding and numerical algorithms, but with with poor argument or presentation	h substantial inac	dequacies in applying then			
	Fail	Demonstrate poor and inadequat algorithms or their applications, or			tify appropriate theor	rems and numerical	
Course Type	Lecture-bas	sed course					
Course Teaching	Activities		De	etails		No. of Hours	
& Learning Activities	Lectures					36	
	Tutorials					12	
	Reading /	Self study				100	
Assessment Methods and Weighting	Methods	Details	<u>'</u>	Weighting in fina		sment Methods CLO Mapping	
	Examination			222223 3.220 (70	,		

	Test		50	CLO 1,2,3,4,5
Required/recommended reading and online materials		Scientific Computing (McGraw Hill, an: Introduction to Scientific Comput	,	n Series (Prentice Hall, 1997)

MATH4902 Operations reso	earch II (6	credit	S)		Acadei	mic Year	2015	
Offering Department	Mathema	Mathematics Quota						
Course Co-ordinator	Dr G Han	Dr G Han, Mathematics (ghan@maths.hku.hk)						
Teachers Involved	TBC, Mat	hematic	S					
Course Objectives	programn research. with cour	ning (IP There i ses on	to provide a fundamental a), dynamic programming (DP s emphasis on aspects of algor linear programming and networ re advanced studies in operation) and Mark rithms as we ork models,	ov decision proce ell as applications to provide essentia	esses (MDF The course) in operation serves, togethe	
Course Contents & Topics	- Dynamic	 Integer programming and heuristics. Dynamic programming (deterministic/stochastic). Markov decision process (discounted/average costs). 						
Course Learning Outcomes	On succe	ssful co	mpletion of this course, student	s should be	able to:			
			and the terminology and nom- ming and Markov decision proc		opropriate to integ	er program	ming, dynamic	
			the typical techniques employ decision process	ed in integ	er programming, c	lynamic pro	gramming and	
	CLO 3	demonst	rate the knowledge on algorithr	ns for a vari	ety of problems in o	operations re	esearch	
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in MATH2101 Linear algebra I and MATH2211 Multivariable calculus; and Pass in MATH3901 Operations research I, or already enrolled in this course.						
Offer in 2015 - 2016	N				Examir	nation		
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	appropreser correc	Demonstrate an excellent understanding of key concepts and ideas by being able to identify basic princi appropriate theorems, algorithms and their applications through correctly analysing problems, clearly and eleg presenting correct logical reasoning and argumentation and being able to carry out computations carefully correctly, and to solve problems with some innovative approaches.				early and elegantly tions carefully and	
	В	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.						
	Demonstrate an acceptable understanding of key concepts and ideas by being able to identify basic princi appropriate theorems, algorithms and their applications but with some inadequacies in applying the theorems thr incorrectly analysing problems with poor argument and presentation or a number of minor computational errors.					e theorems through		
	D	Demonstrate some understanding of key concepts and ideas by being able to identify basic principles, appropria 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.					theorems through	
	Fail		nstrate poor and inadequate understan hms or their applications, or not being a				oropriate theorems,	
Course Type	Lecture-b	ased co	urse					
Course Teaching	Activitie	s		Details			No. of Hours	
& Learning Activities	Lectures						36	
	Tutorials						12	
	Reading	/ Self st	udy				100	
Assessment Methods and Weighting	Methods	S	Details		ghting in final rse grade (%)		ment Methods	
	Examina	tion			50		1,2,3	
	Test				50	CLO	1,2,3	
Required/recommended reading and online materials	P. Thie: N	1arkov D	Law: The Art and Theory of Dy Decision Processes (COMAP, Ir and L.A. Wolsey: Integer and C	nc. 1983)	• •	·	77)	

MATH4907 Numerical me	Academic Year	2015					
Offering Department	Mathematics						
Course Co-ordinator	TBC, Mathematics ()						
Teachers Involved	TBC, Mathematics	TBC, Mathematics					
Course Objectives							

		This course aims at providing effective numerical methods as well as their theoretical aspects for solving problems arisen from financial derivatives and asset pricing.							
Course Contents & Topics	approach - Numerio	 Introduction to the mathematical theory of vanilla and exotic options, both the PDE and the Martinga approach. Numerical methods for Black-Scholes pricing differential equations and their performance analyses. Binomial tree methods, Monte Carlo simulations and their performance analyses. 							
Course Learning Outcomes	On succe	essful co	empletion of this course, students	s should be	able to:				
		demonstrate knowledge and understanding of the martingale theory in option pricings as well as related financial derivatives							
		impleme equation	ent and analyse various nume	rical metho	ds on the Black	-Scholes pi	ricing differential		
			and the connection between the		ee method and the	e finite diffe	rence method of		
			ent and analyse Monte Carlo sim		hods on the martir	ngale pricing	g formula		
Pre-requisites (and Co-requisites and Impermissible combinations)		ИАТНЗ9	06 Financial calculus or equivale	ent.					
Offer in 2015 - 2016	N				Exami	nation			
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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.							
	В	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	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	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems or the applications, or not being able to complete the solution.					e theorems or their		
Course Type	Lecture-b	ased co	ourse						
Course Teaching	Activitie	es		Details			No. of Hours		
& Learning Activities	Lectures	3					36		
	Tutorials	3					12		
	Reading	/ Self s	tudy				100		
Assessment Methods and Weighting	Methods	s	Details		ghting in final rse grade (%)		sment Methods o CLO Mapping		
	Examina	ation			50	CLO	1,2,3,4		
	Test				50	CLO	1,2,3,4		
Required/recommended reading and online materials	Alison Etl Wilmott, (Oxford F	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 (Oxford Financial Press) P. Glasserman: Monte Carlo Methods in Financial Engineering (Latest Edition) (Springer-Verlag)							
Course Website			xu.hk/course/MATH4907/	J	3 ((-13-1	3,		

MATH4910 Senior mather	natics seminar (6 credits)	Academic Year	2015
Offering Department	Mathematics	Quota	12
Course Co-ordinator	Prof T W Ng, Mathematics (ntw@maths.hku.hk)		
Teachers Involved	Prof T W Ng, Mathematics Dr Y K Lau, Mathematics Dr B Kane, Mathematics		
Course Objectives	This seminar style capstone course aims to provide students articles and book chapters, followed by group discussions synthesis will be attained. Students will look at particular math topics through reading, listening, discussing and writing.	through which knowledge	acquisition and
Course Contents & Topics	This seminar course may be in the form of research seminar, Research seminar provides first-hand research experience to of knowledge brought about by the readings, and the difficulti Reading seminar involves discussions on arguments delivered convincing the arguments are. Participants will experience the	students, who will discuss the les they encounter in the re- by the authors of books or a	e advancement search process rticles, and how

	of knowledge and development of research idea. Student performance is manifested in their preparally quality of comments, responsiveness to comments and overall engagement in the seminar. product is a research paper or written report and oral presentations. Topics chosen by the instructional product is a research paper or written report and oral presentations.							nar. The end
Course Learning Outcomes	On succes	sful comple	etion of this course, students	should	be able to:			
	CLO 1 ex	kplain and	discuss the contents of the to	opics th	ey studied			
	CLO 2 cr	itique and	argue about the ideas and th	neories	of the work they	studied		
			d synthesize the material thall language	ey hav	e learned, and i	report orally	and in	writing using
Pre-requisites (and Co-requisites and Impermissible combinations)	MATH4XX Algebra I, I Subject to This capsto	Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3 MATH4XXX, or MATH7XXX) in the Mathematics, and Mathematics/Physics Majors including MATH3 and MATH3 and MATH3 and MATH3 functions of a complex variable. Subject to approval by the Department. This capstone course is for Mathematics, and Mathematics/Physics Majors students only. The earliest that a student is allowed to take this capstone course is their year 3 study.						
Offer in 2015 - 2016	N				E	Examinatio	n	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	insightful a	te an excellent understanding of nalyses and raising critical points in and effective application of the k	in group	discussion. Demons	trate clear and	d critical an	alysis, coherent
	В	B Demonstrate a good understanding of the material by mostly clear and effective presentation. Engage a group discussion most of the time by providing helpful points and asking questions that advance the dis Demonstrate mostly clear and effective analysis, synthesis, and application of the knowledge through writing presentation using mathematical language.					the discussion.	
	С	C Demonstrate a general understanding of the material by moderately effective presentation. Engage in group discussion most of 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.						
	D 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 knowledge through writing and oral presentation using mathematical language.						
Course Type	Project-bas	sed course						
Course Teaching & Learning Activities	Activities	;		Detail	s		ı	No. of Hours
	Meeting with supervisor			Seminars: Students take turns to give presentations to the whole class; group discussions.				36
	Reading /	Self study		for discus	ng material and presentations sions; writi s/research paper	s and ing of		100
Assessment Methods and Weighting	Methods		Details		Weighting in course grade			ent Methods LO Mapping
	Dissertation	on	Coursework assessment: on class participation and discussions.			20	CLO 1,2,3	
	Oral prese	entation	Seminar presentations students	by		30	CLO	1,2,3
	Research	report	Written report / research Individual and/or reports/research papers tot more than 10,000 words.	group		50	CLO	1,2,3
Required/recommended reading and online materials	TBC							

MATH4911 Mathematics c	Academic Year	2015					
Offering Department	Mathematics	Quota					
Course Co-ordinator	Dr S P Yung, Mathematics (spyung@hku.hk)						
Teachers Involved	Dr S P Yung, Mathematics						
Course Objectives	This course aims to provide students an experience of engaging in and/or application of the mathematical knowledge they have acquired.	a project which requi	res integration				
Course Contents & Topics	Students will work collaboratively in small groups on a project under the guidance of their supervisor(semphasis of this capstone project is on the integration and/or application of mathematical knowledges).						

	acquired by the students. The project topic is not limited to academic context, but can also be a community or corporate outreach project. Projects may take the form of a combination research, survey, data analysis, creation of artifacts or media contents, exhibition, pu development of solution plan for the problem under study, etc. Assessment may take the for report, oral presentation, media production, portfolio, and/or peer evaluation, etc. Topics are object to the supervisor(s), or proposed by the students and approved by their supervisor(s).								
Course Learning Outcomes	On succ	On successful completion of this course, students should be able to:							
	CLO 1	integrate an	d apply mathematical knowle	edae the	v have previous	lv acquired			
		CLO 1 integrate and apply mathematical knowledge they have previously acquired CLO 2 work collaboratively with others							
			te their project topic to expe	erts and	l/or lav audienc	es through s	suitable media using		
			mathematical terms and lang				g		
Pre-requisites (and Co-requisites and Impermissible combinations)	MATH42 Subject This cap (This co	Pass in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX MATH4XXX, or MATH7XXX) in the Mathematics, and Mathematics/Physics Majors. Subject to approval by the Department. This capstone course is for Mathematics, 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 the capstone course is their year 3 study.)							
Offer in 2015 - 2016	N				E	Examination	ı		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	acquired.	ate excellent and creative integra Take initiative in, and collaborate edia using appropriate mathematica	highly e	ffectively on, the p				
	В	actively in		olication of the mathematical knowledge previously acquired. Participally on, the project. Communicate mostly effectively through suitable med language.					
	С	C Demonstrate a general level of integration and/or application of the mathematical knowledge properties to be demonstrate moderately effective collaboration on the project. Moderately effective commathematical terms and language.							
	D	Demonstra	emonstrate some partial integration and/or application of the mathematical knowledge previously acquired. emonstrate barely effective collaboration on the project. Show limited ability to effectively communicate using athematical terms and language.						
	Fail	Fail Demonstrate weak or poor integration and/or application of the mathematical knowledge previously acquired. Show passive participation in, and ineffective collaboration on, the project. Communicate ineffectively using mathematical terms and language.							
Course Type	Project-l	pased course	9						
Course Teaching	Activiti	es		Detail	s		No. of Hours		
& Learning Activities	Meeting	Meeting with supervisor			nts meet v visor(s) to preser suss their progres		20		
	Assess	ment		Projec their p	t work: Student roject	130			
Assessment Methods and Weighting	Method	ls	Details		Weighting in course grade		ssessment Methods to CLO Mapping		
	Dissertation								
	Dissert	ation	Coursework assessment: on participation and collab throughout the whole projection.	oration		20	CLO 1,2,3		
		ation	on participation and collab	oration ct. ents of minars,		30	CLO 1,2,3 CLO 1,2,3		
	Oral pro		on participation and collab throughout the whole project oral presentation componing the project may include ser lectures, oral reports, recordings, etc. Written report / media proof This part may include reports, booklets, exi	oration ct. ents of minars, audio					
Required/recommended reading and online materials	Oral pro	esentation	on participation and collab throughout the whole project oral presentation componing the project may include set lectures, oral reports, recordings, etc. Written report / media production or may include reports, booklets, eximaterials, video productions.	ents of minars, audio luction: written nibition		30	CLO 1,2,3		

MATH4966 Mathematics	Academic Year	2015						
Offering Department	Mathematics	Quota						
Course Co-ordinator	Prof T W Ng, Mathematics (ntw@maths.hku.hk)	Prof T W Ng, Mathematics (ntw@maths.hku.hk)						
Teachers Involved	All teaching staff, Mathematics							
Course Objectives		This course aims to offer students the opportunities to gain work experience in the industry related to their major of 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 nternship work either within the University or outside the University arranged by the department.							
Course Contents & Topics		Vithin the university: each student will be supervised by a staff member (supervisor), working on a projections tasks as instructed by the supervisor. Outside the university: each student will carry out approved work under the guidance and supervision xternal supervisor.							
Course Learning Outcomes	On succes	sful com	pletion of this course, students s	hould be able to:					
	CLO 1	gain wor	k experience in an industry relat	ed to mathematical	sciences				
	CLO 2	have an	understanding of how mathemat	tics is used to solve	real-world problem	s			
Pre-requisites (and Co-requisites and Impermissible combinations)	MATH4XX This capst	is in at least 24 credits of advanced level disciplinary core/elective mathematics courses (MATH3XXX TH4XXX, or MATH7XXX) in the Mathematics, and Mathematics/Physics Majors. It is capstone course is for Mathematics, and Mathematics/Physics Majors students only. It is earliest that a student is allowed to take this capstone course is their year 3 study.							
Offer in 2015 - 2016	Y 1st	sem 2n	d sem Summer		Examination	No Exam			
Offer in 2016 - 2017	Υ								
Course Grade	Pass/Fail	ass/Fail							
Grade Descriptors	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	Fail Very limited or no ability to solve problems in the workplace. Fails to handle or carry out the work required in the job assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), oth 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	3		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)		160			
Assessment Methods and Weighting	Methods		Details	Weighting in course grad		essment Methods to CLO Mapping			
	Written re	port	written report, employed feedback and oral presentation		100 C	CLO 1,2			
Additional Course Information	internship Students v Enrolment	tisfactory completion of this course can be counted towards the Capstone requirement. Deta ernship will be recorded on the student's transcript. This course will be assessed on "Pass/Fail" ludents who are interested to enrol in this course should contact the Department to obtain the approva rolment of this course is not conducted via the online course selection system and should be ough the relevant Department/School office after approval has been obtained from the course coording							

MATH4999 Mathematics	project (2 credits)		Academic Year	2015			
Offering Department	Mathem	tics		Quota				
Course Co-ordinator	Prof W I	Ching, Mathematics (wching@hku.hk)						
Teachers Involved	All teach	ng staff, Mathematics						
Course Objectives	problem	e aim of the course is to provide students with the opportunity to formulate and to investigate, in depth blems of practical interest and/or to have a foretaste of mathematical research. The work, to be done or individual basis, is considered a highly desirable part of the training of a mathematician.						
Course Contents & Topics	supervis	ect matter of the project will be determ or. The projects will be selected from areas ading and get the approval from both the prose.	of pure and applied	mathematics. Stude	ents must achieve			
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 study independently and in depth an advanced topic that is not available in the regular curriculum							
	CLO 2 analyze and synthesize information gathered from different sources							
	CLO 3 articulate their findings and conclusions							
	CLO 4 give an exposition of their work in a written report							
Pre-requisites (and Co-requisites and Impermissible combinations)	MATH4. Algebra Subject This cap	at least 24 credits of advanced level disciporate (at least 24 credits of advanced level disciporate), and MATH3401 Analysis I, and MATH3403 Further (approval by the Department, and Mathematics), and Mathematics (at least that a student is allowed to take this cap	and Mathematics/F nctions of a comple: matics/Physics Majo	Physics Majors incl x variable. ors students only.				
Offer in 2015 - 2016	Y Y	ar long		Examination	No Exam			

Offer in 2016 - 2017	Y	Y							
Course Grade	A+ to F	A+ to F							
Grade Descriptors	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	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 reference aptly. Correct use of data of results to draw appropriate conclusions. Apply effective organizational and presentational skills.							
	С	thinking and to	strate general but incomplete grasp of the g. Use of relevant information from sources, reference aptly. Mostly correct but some noderately effective organizational and pres	showing ability to make comperroneous use of data and	oarisons between c	lifferent interpretations			
	D	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	analytic of then	strate evidence of little or no grasp of the keal and critical abilities, logical and coherent. Misuse of data and results and/or unable minimally effective or ineffective.	t thinking. Limited use of seco	ndary sources and	no critical comparison			
Course Type	Project-ba	sed cou	rse						
Course Teaching	Activities	s		Details		No. of Hours			
& Learning Activities	Reading	Reading / Self study		independent work & to attend meetings & seminars		240			
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		ssment Methods to CLO Mapping			
	Dissertati	ion	Written report plus ora presentation	100	CLO	1,2,3,4			

MATH7101 Intermediate co	omplex a	nalysis (6 credits)	Academic Year	2015					
Offering Department	Mathem	atics	Quota						
Course Co-ordinator	Prof N N	Prof N Mok, Mathematics (nmok@hku.hk)							
Teachers Involved	Prof N N	lok, Mathematics							
Course Objectives		ective is to familiarize students with analytic, algeb or of Complex Analysis in a single variable beyond a							
Course Contents & Topics	surfaces construct the Mitta Riemann - In the terms of - A cho Riemann	In the course we study meromorphic functions on compact Riemann surfaces and on open Riemann surfaces using analytic and algebraic techniques. Topics on meromorphic functions include constructions of meromorphic functions on compact Riemann surfaces, elliptic functions, Poincare ser ne Mittag-Leffler Problem and the Weierstrass Problem on compact Riemann surfaces and on operation of the course of study of meromorphic functions, sheaf cohomology theory and cohomology theories terms of differential forms will be introduced. A choice of other topics will be included. Examples of possible topics include normal families, Riemann Mapping Theorem, geometric theory of holomorphic mappings, potential theory in one comparariable, complex dynamics, and special functions.							
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 deal with rational functions on the Riemann Sphere and deal with elliptic functions, equivalently meromorphic functions on elliptic curves								
	CLO 2 formulate various classical existence problems on meromorphic functions and reduce them to analytic or cohomological problems, being able to solve them in certain typical cases								
	CLO 3 identify the key arguments in the proofs of various mathematical results concerning meromorphic functions on compact Riemann surfaces or on plain domains								
	CLO 4 identify the key elements in the theoretic 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)		a first course in Complex Analysis such as MA by the course coordinator.	TH3403 Functions of a comp	olex variable, an					
Offer in 2015 - 2016	Y 19	t sem	Examination	Dec					
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriat theorems and their applications through correctly analysing problems, clearly and elegantly presenting correct logic reasoning and argumentation and being able to carry out computations carefully and correctly, and with som innovative approaches to solving problems.							
	В								

	theo	theorems, but with some inadequacies in applying the theorems through incorrectly analysing problem argument and presentation or a number of minor computational errors.						
	but							
		Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems applications, or not being able to complete the solution.						
Course Type	Lecture-based	Lecture-based course						
Course Teaching & Learning Activities	Activities		D	etails	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			
	Examination			50	CLO 1,2,3,4			
	Test	Test 50 CLO 1,2,3						
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)							

MATH7201 Topics in geom	etry (6 cred	ts)			Academic Year	2015			
Offering Department	Mathematics				Quota				
Course Co-ordinator	Prof W K Ch	ing, Mathematics (wcl	hing @hku.hk)						
Teachers Involved	TBC, Mathe	TBC, Mathematics							
Course Objectives		This course introduces to students a main area of differential geometry beyond the notion of manifolds and the calculus of differential forms and prepares them to study further and to do research in geometry.							
Course Contents & Topics	to) the follow (i) Riemann Laplace and (ii) Sympled Hamiltonian (iii) Vector	The topic varies according to the year and the instructor. For example, it can be one of (but not restricted to) the following: (i) Riemannian geometry: affine and Levi-Civita connection, Riemann curvature tensor, spinor bundles Laplace and Dirac operators, harmonic forms and spinors, applications in relativity; (ii) Symplectic geometry: symplectic vector spaces, symplectic manifolds, Lagrangian submanifolds Hamiltonian group actions, moment maps, symplectic quotients, convexity theorems, localization; (iii) Vector bundles: vector bundles, connection and curvature, characteristic forms and classes superconnections, transgression, topological K-theory, introduction to index theory.							
Course Learning Outcomes	On successf	ul completion of this c	ourse, students	should be able to:					
	CLO 1 hav	CLO 1 have a working knowledge of the calculus of differential forms beyond the level of MATH3511							
		CLO 2 understand the keys points of the particular subject chosen and be ready to learn other topics in Geometry							
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in (MATH4402 Analysis II or MATH4501 Geometry) and (MATH4511 Introduction to differentiable manifolds or the approval of the course coordinator).							
Offer in 2015 - 2016	N				Examination				
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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.							
	В	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 appror theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with 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 theore but with substantial inadequacies in applying the theorems through incorrectly analysing problems with argument or presentation or with substantial computational errors.							
	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriately applications, or not being able to complete the solution.								
Course Type	Lecture-base	ed course							
Course Teaching	Activities			Details		No. of Hours			
& Learning Activities	Lectures					36			
	Reading / S	elf 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		

Teachers Involved Course Objectives This course aims a variety of resease a variety of complex manifolds. Exam (i) Siegel's Theorem and Hotoration of theorem and Hotoration of the variety of complex manifolds. Exam (i) Siegel's Theorem (ii) geometry of complex manifolds. Exam (iii) an introduction on successful coordinate and manifolds. Exam (iv) an introduction on successful coordinate and manifolds. Exam (ii) an introduction on successful coordinate and manifolds. Exam (iv) an introduction on successful coordinate and manifolds. Exam (iv) an introduction on successful coordinate and manifolds. Exam (iv) an introduction on successful coordinate and manifolds. Exam (iv) and manifolds. Exam (iv) and manifolds. Exam (iv) an introduction on successful coordinate and manifolds. Exam (iv) an introduction (iv) an introduc	ematics (nmok@hku.hk)	Quota						
Teachers Involved Course Objectives This course aims a variety of resea Course Contents & Topics Course Contents & Topics Course Contents & Topics Course Contents & Topics Complex manifold Theorem and Hob Theorem (ii) geometry of or (iii) an introductio (iv) an introductio (ematics (nmok@hku.hk)							
Course Objectives Course Contents & Topics Course Contents & Topics Course Contents & Topics This course contend of the course of cohomology, contend of the complex manifold. Exam (i) Siegel's Theorem and Hother The course commanifolds. Exam (i) Siegel's Theorem (ii) geometry of complex manifolds. Exam (iii) geometry of complex manifolds. Exam (iv) an introduction (iv) an introductio		Prof N Mok, Mathematics (nmok@hku.hk)						
A variety of resear cohomology, coh Hermitian holomoly. It proceeds to complex manifolds. Exam (i) Siegel's Theorem and Hornitian introduction (iv) an intro	3							
cohomology, coh Hermitian holomotic - It proceeds to complex manifold. Exam (i) Siegel's Theorem (ii) geometry of complex manifolds. Exam (i) Siegel's Theorem (ii) geometry of complex manifolds. Exam (i) Siegel's Theorem (ii) geometry of compact (iii) an introduction (iv) and introduction (iv) and intr	This course aims to present the foundation of the theory of complex manifolds and to introduce students to a variety of research topics, focusing on compact complex manifolds.							
CLO 1 grasp the existence compact CLO 2 grasp the and make theorem CLO 3 grasp the on Kahle notions of the course and limpermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors A Demonstration permissible combinations C Demonstration permissible combinations C Demonstration permissible course in Difference permissible permissible course in Difference permissible	This course contains an introductory part on basic notions on complex manifolds including shear cohomology, cohomology theories in terms of differential forms, Hermitian and Kahler manifolds, and Hermitian holomorphic vector bundles. It proceeds to introduce the theory of harmonic forms, establishing fundamental results on compact complex manifolds including Serre duality, the Kodaira Vanishing Theorem, the Kodaira Embedding Theorem and Hodge decomposition on compact Kahler manifolds. The course concludes with a choice of topics on analytic and geometric aspects of the theory of complemanifolds. Examples of such topics include (i) Siegel's Theorem on the field of meromorphic functions on a compact complex manifold; (iii) geometry of compact quotients of bounded symmetric domains and Hermitian symmetric manifolds; (iii) an introduction to the deformation theory of complex structures on a compact complex manifold.							
CLO 2 grasp the and make theorem. CLO 3 grasp the notions of the course and Co-requisites and course in Different. Pre-requisites and course in Different. Pass in a first concurse in Different. Pass in a first concurse in Different. Note the course of the course in Different. Note the course of the course of the course in Different. Course Grade A+ to F A Demonstrate and the course in Different. Course Grade A+ to F Course Type Course Type Course Type Course Type Course Teaching Activities Lectures	npletion of this course, students should be abl	e to:						
and mal theorem CLO 3 grasp th on Kahle notions of CLO 4 identify 1 course as a first corporate in Different part of the course	e notion of holomorphic line bundles, under of global holomorphic sections of line bundle complex manifolds							
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors A Demo their and theore argum D Demo but we argum Fail Demo applic Course Type Course Type Course Teaching & Learning Activities CLO 4 identify to course a first concurse in Different Pass in a first concurse in Different N A Demo theore reason The course of the course argum D Demo but we argum Ecourse Type Course Type Course Type Lecture-based course Teaching A Lectures	CLO 2 grasp the relationship between sheaf cohomology, de Rham cohomology and d-bar cohomology, and make use of the relationship to solve various existence problems by means of vanishing theorems on harmonic forms							
Course and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors A Demonstrate and theorem of their and the argum of the condition of their and the condition of the condition of their and the condition of the condition	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							
course in Different course	CLO 4 identify the key elements in the theoretic foundation of various additional topics covered in the course and to make use of them in solving problems							
Offer in 2016 - 2017 Course Grade A+ to F A Demonstrate Procession of theore reason innovation of their at the application of the process	urse in Complex Analysis such as MATH340 ial Geometry such as MATH4501 Geometry,							
Course Grade A+ to F A Demonstrates Paragram B Demonstrates Paragram D Demonstrates Paragram Ecourse Type Course Type Course Teaching & Lecture-based course Course Teaching & Lectures		Examination						
A Demo theore reason innoval B Demo their a the application of the properties of the								
B Demo theore reason innova B Demo their a the ap C Demo theore argur D Demo but w argur Fail Demo applic Course Type Lecture-based co Activities Lectures								
their at the ap C Demonstrate and the paper of the paper	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 logica reasoning and argumentation and being able to carry out computations carefully and correctly, and with some innovative approaches to solving problems.							
theore argum D Demo but w argum Fail Demo applic Course Type Lecture-based co Course Teaching & Learning Activities Lectures	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.							
but wargum Fail Demo applic Course Type Lecture-based co Course Teaching & Learning Activities Lectures	Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify approximate theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with argument and presentation or a number of minor computational errors.							
applic Course Type Lecture-based co Course Teaching & Learning Activities Lectures	strate some understanding of key concepts and ideas by th substantial inadequacies in applying the theorems ent or presentation or with substantial computational error	through incorrectly analysing						
Course Teaching & Learning Activities Lectures	Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorem applications, or not being able to complete the solution.							
& Learning Activities Lectures	ırse							
Lectures	Details		No. of Hours					
Pooding / Solf at			36					
Reading / Self st	ıdy		100					
Assessment Methods Methods Ind Weighting		ng in final Asse	ssment Method to CLO Mapping					
Examination		50 CL	O 1,2,3,4					

Required/recommended	P. Griffiths & J. Harris: Principles of Algebraic Geometry, Pure and Applied Mathematics (Wiley-						
reading	Interscience Publishers, New York 1978)						
and online materials	K. Kodaira: Complex Manifolds and Deformation of Complex Structures (Grundlehren der mathematischen						
	Wissenschaften 283, Springer-Verlag, Berlin-Heidelberg 1986)						
	N. Mok: Metric Rigidity Theorems on Hermitian Locally Symmetric Manifolds (World Scientific, Singapore-						
	New Jersey 1989)						

MATH7217 Topics in financial mathematics (6 credits)					Academic '	Year	2015		
Offering Department	Mathemat	ics			Quota				
Course Co-ordinator	Dr J Song	Dr J Song, Mathematics (txjsong@hku.hk)							
Teachers Involved	TBC, Math	TBC, Mathematics							
Course Objectives	managem	This course aims at introducing students to fundamental knowledge in financial mathematics and risl management. It can help preparing students to research or take more advanced courses in those directions.							
Course Contents & Topics	Interest rMathemaEstimation	 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 Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 u	ındersta	nd and be able to utilize vario	us models and results	in investment	and inte	erest rate		
	CLO 2 g	rasp the	e methodology in derivative pri	cings and the modelir	ng of volatilities	5			
			nd and be able to utilize the os chosen that year	concept of risk measu	res and risk m	nanagen	nent, subject to		
Pre-requisites (and Co-requisites and Impermissible combinations)			ced level mathematics course e course coordinator.	s (MATH3XXX, MATH	14XXX, or MA	TH7XXX	() and subject to		
Offer in 2015 - 2016	N	N Examination							
Offer in 2016 - 2017	N	N							
Course Grade	A+ to F	A+ to F							
Grade Descriptors	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	C Demonstrate an acceptable understanding of key concepts and ideas by being able to correctly identify appropria theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with po 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 poo 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 co	urse						
Course Teaching	Activities	s		Details			No. of Hours		
& Learning Activities	Lectures						36		
	Reading / Self study						100		
Assessment Methods and Weighting	Methods	i	Details	Weighting in course grad			ment Methods CLO Mapping		
	Assignme	ents			50	CLO	1,2,3		
	Examinat	tion			50	CLO	1,2,3		
Required/recommended reading and online materials	ТВС			·	·				

MATH7219 Topics in ap	Academic Year	2015						
Offering Department	Mathematics	Mathematics Quota						
Course Co-ordinator	Dr S P Yung, Mathematics (spyung @hku.hk)	Dr S P Yung, Mathematics (spyung@hku.hk)						
Teachers Involved	TBC, Mathematics	TBC, Mathematics						
Course Objectives		This is a graduate to advanced undergraduate university level course on applied functional analysis, which aims at introducing to students the basic knowledge of using functional analysis on various applied topics in						

	mathematic	s. This	s course would lay a foundation	on fo	r students in studyir	ng more adva	nced mathematica
Course Contents & Topics Course Learning Outcomes	Applications - Sobolev sp - Hilbert sp operators), linear opera - Application Wherever n (Hahn-Bana Principle) ar	 Generalized functions (also called distributions), delta function, generalized Fourier Transform. Applications to differential equations, Fundamental solution, Green's function. Sobolev spaces, Sobolev Embedding Theorem, Trace. Hilbert space linear operator theory (bounded operators, compact operators, closed unbounded operators), spectral 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 (Hahn-Banach Theorem, Opening Mapping Theorem, Closed Graph Theorem and Uniform Boundedness Principle) and Hilbert spaces (Orthogonality and best approximation, Fourier isometry). On successful completion of this course, students should be able to: 					
3							
			neralized functions and their Fo		· · · · · · · · · · · · · · · · · · ·	•	
		derstar uations	nd Sobolev spaces and how s	v to	apply them in the	process of	solving differential
	CLO 3 und	dersta	nd Hilbert space linear operato	r thec	ory and apply it in sol	ving differentia	al equations
	CLO 4 app	ply the	se results to optimization probl	ems			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in MA	TH340	1 Analysis I and MATH4404 Fo	unctic	onal analysis, or appr	oval of the co	urse coordinator.
Offer in 2015 - 2016	N	N Examination					
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F	A+ to F					
Grade Descriptors	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 approp theorems, but with some inadequacies in applying the theorems through incorrectly analysing problems with argument and presentation or a number of minor computational errors.					ctly identify appropriate ng problems with poor
	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.						
Course Type	Lecture-bas	ed cou	ırse				
Course Teaching & Learning Activities	Activities			De	tails		No. of Hours
a Louining Addivides	Lectures						36
	Reading / Self study 100						
Assessment Methods and Weighting	Methods		Details		Weighting in fina course grade (%		essment Methods to CLO Mapping
	Assignmen	nts			50)	
	Examinatio	n			50)	
Required/recommended reading and online materials	TBC						

MATH7224 Topics in adva	Academic Year	2015								
Offering Department	Mathem	atics	Quota							
Course Co-ordinator	Dr G Ha	Dr G Han, Mathematics (ghan@maths.hku.hk)								
Teachers Involved		Dr G Han, Mathematics Dr J Song, Mathematics								
Course Objectives	senior u	This course aims at introducing fundamental knowledge in probability theory to graduate students and senior undergraduate students. It can help preparing these students for advanced research in probability theory and its wide-range applications.								
Course Contents & Topics		Measure theory, law of large numbers, central limit theorems, random walks, martingales, Markov chains, ergodic theorems, Brownian motion.								
Course Learning Outcomes	On succ	essful completion of this course, students should be ab	ole to:							
	CLO 1 demonstrate in-depth understanding of basic concepts and terminologies in probability theory									
	CLO 2									

		understand and apply the fundamental theorems for further problem solving in theorems the learning outcomes are subject to the topics chosen that year						
Pre-requisites (and Co-requisites and Impermissible combinations		Pass in MATH3603 Probability theory and MATH4402 Analysis II and approval of the course coordinator.						
Offer in 2015 - 2016	Y 1st ser	1st sem Examination Dec						
Offer in 2016 - 2017	N			,		'		
Course Grade	A+ to F							
Grade Descriptors	t t	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.						
	t	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.						
	t	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.						
	- t	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-base	ed course						
Course Teaching	Activities		С	Details		No. of Hours		
& Learning Activities	Lectures					36		
	Reading / Se	elf study				100		
Assessment Methods and Weighting	Methods	Details		Weighting in fin		ssment Methods to CLO Mapping		
	Assignments	S		į.	50 C	CLO 1,2		
	Examination	1			50 C	CLO 1,2		
Required/recommended reading and online materials		Rick Durrett: Probability: Theory and Examples, Cambridge Series in Statistical and Probabilistic Mathematics (Cambridge University Press, 2010, 4th edition)						
Course Website	http://hkumat	h.hku.hk/course/MATH72	24/					

MATH7501 Topics in algeb	ora (6 credi	its)	Academic Year	2015				
Offering Department	Mathemat	ics	Quota					
Course Co-ordinator	Dr Z Hua,	Mathematics (huazheng@maths.hku.hk)		·				
Teachers Involved	Dr Z Hua,	Mathematics						
Course Objectives		To provide students specializing in mathematics with the opportunity to study some topics in algebra in greater depth.						
Course Contents & Topics	quadratic	 A selection of advanced topics in algebra such as group theory; rings and modules; Galois theory; quadratic forms; multilinear algebra; algebraic number theory; group representations; commutative algebra; Grobner basis theory; introduction to algebraic geometry. Topics may vary from year to year. 						
Course Learning Outcomes	On succes	ssful completion of this course, students should be able	to:					
	CLO 1	acquire knowledge in the covered topics to considera	ble depth					
	CLO 2 if he/she wishes, pursue more advanced studies in areas of algebra							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	ATH4302 Algebra II.						
Offer in 2015 - 2016	Y 2nd	sem	Examination	May				
Offer in 2016 - 2017	N			'				
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate an excellent understanding of key concepts and ideas by being able to identify the appropriat 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 som 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							

	bu	Demonstrate some understanding of key concepts and ideas by being able to correctly identify appropriate the but with substantial inadequacies in applying the theorems through incorrectly analysing problems with argument or presentation or with substantial computational errors. Fail Demonstrate poor and inadequate understanding by not being able to identify appropriate theorems of applications, or not being able to complete the solution.							
Course Type	Lecture-based	d course							
Course Teaching & Learning Activities	Activities		Det	ails	No. of Hours				
a Learning Activities	Lectures				36				
	Reading / Sel	lf study			100				
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping				
	Assignments	coursework assessments (include presentations)	may	50	CLO 1,2				
	Examination	One 2.5-hour written examina	tion	50	CLO 1,2				
Required/recommended reading and online materials	To be decided	by the course instructor.							
Course Website	http://hkumath	.hku.hk/course/MATH7501/							

MATH7502 Topics in applie	ed discret	e math	ematics (6 credits)			Academic Yea	r	2015			
Offering Department	Mathema	tics				Quota					
Course Co-ordinator	Prof W Za	ang, Mat	hematics (wzang@maths.hku.h	ık)							
Teachers Involved	TBC, Mat	hematic	S								
Course Objectives	To provid	e studer	nts with the opportunity to study	some	further topics in	applied discrete	ma	thematics.			
Course Contents & Topics	cryptogra	phy, dis	advanced topics in discrete macrete optimization, extremal coatics. The selection may vary fro	ombir	atorics, and alge						
Course Learning Outcomes	On succe	ssful co	mpletion of this course, students	sho	uld be able to:						
		demonst mathema	rate knowledge and understatics	andin	g of some res	earch areas o	of ap	oplied discrete			
	CLO 2	solve va	rious discrete mathematics prob	lems	using some adva	anced technique	s				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in M	ss in MATH3301 Algebra I and MATH3600 Discrete mathematics.									
Offer in 2015 - 2016	N					Examination					
Offer in 2016 - 2017	Υ										
Course Grade	A+ to F										
Grade Descriptors	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.										
	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		nstrate poor and inadequate underst ations, or not being able to complete the			to identify approp	riate	theorems or their			
Course Type	Lecture-b	ased co	urse								
Course Teaching	Activitie	es		Det	ails			No. of Hours			
& Learning Activities	Lectures							36			
	Reading	/ Self st	udy					100			
Assessment Methods and Weighting	Methods	5	Details		Weighting in f			ment Methods CLO Mapping			
	Assignm	Assignments coursework assessment			50		CLO 1,2				
	Examina	ition	One 2.5-hour written examina	tion		50	CLC	1,2			
Required/recommended reading and online materials	Instructor	's lecture	e notes.								

MATH7503 Topics in mathe	ematical p	rogran	nming and optimization (6	cre	dits)	Acad	demic Year	2015		
Offering Department	Mathemat	ics				Quo	ta			
Course Co-ordinator	Prof W Za	ng, Matl	hematics (wzang@maths.hku.h	k)						
Teachers Involved	Dr K Cai, I Prof W Za									
Course Objectives			depth of some special topics into the depth of some special topics in the depth of				ing or optimiz	zation. It is main		
Course Contents & Topics	multi-objed	ctive pr	lvanced topics, which may inclu ogramming and goal program y from year to year.		′ '	, 0	,			
Course Learning Outcomes	On successful completion of this course, students should be able to:									
			nd the advanced concept and otimization approaches as appro					ramming topic(s		
			rate knowledge and understar ormulations and algorithms plus			ing t	heory and te	chniques of the		
Pre-requisites (and Co-requisites and Impermissible combinations)		ass in MATH3901 Operations research I, MATH3904 Introduction to optimization and MATH49 operations research II.								
Offer in 2015 - 2016	Y 1st	1st sem Examination De						Dec		
Offer in 2016 - 2017	N									
Course Grade	A+ to F	A+ to F								
Grade Descriptors	A Demonstrate an excellent understanding of key concepts and ideas by being able to identify 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 to solve problems with some innovative approaches.									
	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 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.									
Course Type	Lecture-ba	ased cou	urse							
Course Teaching	Activities	3		Deta	ails			No. of Hours		
& Learning Activities	Lectures							36		
	Reading /	Self stu	ıdy					100		
Assessment Methods and Weighting	Methods		Details		Weighting in course grade			sment Methods to CLO Mapping		
	Assignme	ents	coursework assessment based on assignments and two class tests		50		Cl	CLO 1,2		
	Examination One 2.5-hour written examination 50						Cl	CLO 1,2		
Required/recommended reading and online materials	S.P. Bradl N. Christo S.S. Rao: G. Nemha	ey, A.C. fides et Optimiz user an	C.M. Shetty: Nonlinear Prograr Hax and T. Magnanti: Applied al (ed.): Combinatorial Optimiza ation Theory and Applications (d L. Wolsey: Integer and Combi uction to Linear Goal Programn	Mathe ation (Wiley inator	ematical Progra John Wiley & S Eastern Ltd., 19 ial Optimization	mming ons, 1 978) (John	g (Addison-W 979) ı Wiley & Son	esley, 1977)		
Course Website			ı.hk/course/MATH7503/		•	- '	,			

MATH7504 Geometric topo	logy (6 credits)	Academic Year	2015					
Offering Department	Mathematics Quota							
Course Co-ordinator	Dr Z Hua, Mathematics (huazheng@maths.hku.hk)							
Teachers Involved	TBC, Mathematics							
Course Objectives	This course gives a geometric introduction to some of the methods of algebraic topology. The emphasis throughout will be on the geometric motivations and applications of the theory.							
Course Contents & Topics	- Continuity. Compactness. Connectedness. The fundamental group surfaces. Theory and applications of simplicial homology. Theory of c spaces.	. Triangulations and covering spaces. The	classification o ory of attaching					

Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1		nd basic ideas and construct as well as in many applications			ant both in p	ursuing the deeper		
	CLO 2	CLO 2 understand the ideas of attaching space, complexes, lifting and extension properties, and surgery on manifolds							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	MATH330	01 Algebra I and MATH3401 An	alysis	s I.				
Offer in 2015 - 2016	N				E	Examination			
Offer in 2016 - 2017	N				'		'		
Course Grade	A+ to F								
Grade Descriptors	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	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	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								
Course Type	Lecture-	based co	urse						
Course Teaching	Activiti	es		Det	tails		No. of Hours		
& Learning Activities	Lecture	s					36		
	Reading	g / Self st	udy				100		
Assessment Methods and Weighting	Method	ls	Details		Weighting in fin		sessment Methods to CLO Mapping		
	Assignr	nents	coursework assessment		50				
	Examin	ation	One 2.5-hour written examina	tion		50			
Required/recommended reading and online materials			Basic Topology (Springer-Verlage roduction to Algebraic Topology						

MATH7505 Real analysis (credits			Academic Year	2015					
Offering Department	Mathem	atics		Quota						
Course Co-ordinator	Prof W	Cheung, Mathematics (wscheung@maths.h	ku.hk)							
Teachers Involved	Prof W	Cheung, Mathematics								
Course Objectives	The aim integral	of the course is to introduce the basic ideas	and techniques	of measure theory a	and the Lebesgu					
Course Contents & Topics	- The Le - Differe continui - Gene converg	ue Measure on R: Measurable sets and Lebe besgue Integral: The Lebesgue integral, mode ntiation and Integration: Functions of bound y. al Measure and Integration Theory: Meas ence theorems, the Radon-Nikodym theorem. o Spaces: The L^p spaces, convergence and	es of convergen- led variation, D surable spaces	ce. differentiation of an , measurable funct	integral, absolu					
Course Learning Outcomes	On successful completion of this course, students should be able to:									
	CLO 1	CLO 1 describe basic properties of Lebesgue measure and measurable functions								
	CLO 2	CLO 2 construct the Lebesgue integral, elucidate its basic properties and appreciate the existence of other useful integration theories besides Riemann's								
	CLO 3 understand the basic features of L^p spaces									
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	MATH3401 Analysis I.								
Offer in 2015 - 2016	Y 2	nd sem		Examination	May					
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	Α									

Department of Mathematics

	D Do	Demonstrate a thorough understanding of all concepts and ideas by being able to draw comple various concepts and apply the theorems through correctly analysing problems, clearly and correct logical reasoning and argumentation, and with some innovative approaches to solving properties.									
	the	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.									
	the	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.									
	bu	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.									
		Demonstrate poor and inadequate understanding by not being able to identify appropriate tapplications, and not being able to complete the solution.									
Course Type	Lecture-based	ecture-based course									
Course Teaching & Learning Activities	Activities		Deta	No. of Hours							
a Learning Activities	Lectures				36						
	Reading / Sel	f study			100						
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping						
	Assignments	coursework assessment		50	CLO 1,2,3						
	Examination	One 2.5-hour written examination	final	50	CLO 1,2,3						
Required/recommended reading and online materials		Real Analysis (Collier MacMillan) I and Complex Analysis (McGraw	Hill)								
Course Website	http://hkumath	.hku.hk/course/MATH7505/									

Offering Department	Physics										
	,	=. :				Quota					
Course Co-ordinator			(mhxie @hku.hk)								
Teachers Involved	Prof K S (, Physics 2), Physics ad 2), Physics								
Course Objectives			comprehensive training and magnetism. A calc				he major _l	ohysical	laws o		
Course Contents & Topics	Units and Motion, F Polygon a Rigid Bod circuits, M law, Amp	This course will introduce and discuss the following topics: Units and Dimensional Analysis, Motion of a Particle in One and Two Dimensions, Newton's Laws Motion, Friction, Curvilinear and Circular Motion on a Plane, Force, Impulse and Momentum, For Polygon and Static Equilibrium, Work and Energy, System of Particles, Moment of Inertia and Rotation of Rigid Body, Simple Harmonic Motion and Pendulum; Electrostatic Fields and Potential, Gauss's Law, Circuits, Magnetic field due to Moving Charges, Force on a Moving Charge in Magnetic Field, Biot-Savalaw, Ampere's law, Electromagnetic Induction, Faraday's Law, Eddy Currents, AC circuits, Phases Capacitive and Inductive Circuits, Power, DC and AC Generators, Transformer.									
Course Learning Outcomes	On succes	ssful comple	etion of this course, stud	ents should	be able to:						
	CLO 1	describe an	d explain the physical p	rinciples of r	nechanics, ele	ectricity ar	d magnet	ism			
	CLO 2	apply these	principles to situations	of the physic	cal and engine	ering wor	d				
	CLO 3 analyze and solve basic problems using the calculus-based approach										
	CLO 4 acquire and interpret experimental data to examine the physical laws										
Pre-requisites and Co-requisites and mpermissible combinations)		vel 3 or above in HKDSE Physics or Combined Science with Physics components or equivalent his course is exclusive for Engineering students.)									
Offer in 2015 - 2016	Y 1st	sem 2nd	sem			Examina	tion	Dec	May		
Offer in 2016 - 2017	Υ	Υ									
Course Grade	A+ to F	A+ to F									
Grade Descriptors	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 learni outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Sho limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational a presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to dra appropriate conclusions.							es. Shov			
	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	ith laborator	y component course								
Course Teaching & Learning Activities	Activitie	s		Details	3			No. of	Hours		
x Learning Activities	Lectures								36		
	Laborato	ry							6		
	Tutorials								8		
	Reading	/ Self study							72		
Assessment Methods and Weighting	Methods	S	Details			Weighting in final course grade (%)		Assessment Method to CLO Mappin			
	Assignme	ents				10	CLO 1,2,3				
	Examination		2-hour written exam			70	CLO 1,2,3				
	Laborato	ry reports				10	С	LO 1,4			
	Test					10		.0 1,2,3			
Required/recommended reading and online materials	R. Serway	y and J.W. J	d by Course Coordinato ewett: Physics for Scier for Scientists and Engir	itists and En	•	nson, 200					

PHYS1055 How things wor	k (6 credit	s)			Academic Year	2015			
Offering Department	Physics				Quota				
Course Co-ordinator	Dr M K Yi	o, Physi	cs (mankit@bohr.physics.hku.h	k)					
Teachers Involved	Dr M K Yi	o, Physi	cs						
Course Objectives	life. The of Logical the Students	This course is designed for students in all disciplines and all years who are curious about science in da fe. The course covers the working principles and mechanisms of the things and phenomena around usogical thinking and appreciation of science are emphasized with mathematics kept at a minimus students are trained to develop scientific intuition and to understand that many "magical" things veryday life can be predictable.							
Course Contents & Topics	application imaging for	ns are e or diagno dern tec	ne science in the household a explored with simple and lucid osis and the magnetic levitated hnology. Contents of the course hology.	explanations. Develop trains in public transp	oments in optical re ortation are introdu	ecording, medica uced as example			
Course Learning Outcomes	On succes	ssful cor	mpletion of this course, students	s should be able to:					
			and discuss the physical princissues in daily life	ciples that are behind	the household ap	pliances and the			
	CLO 2 d	CLO 2 demonstrate their knowledge to related topics qualitatively							
	CLO 3 criticize and express views in logical and effective ways								
	CLO 4 recognize the significance of science and technology								
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL								
Offer in 2015 - 2016	Y 2nd	2nd sem Examination May							
Offer in 2016 - 2017	Υ			,					
Course Grade	A+ to F	A+ to F							
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all th 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	course	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at leas course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and al knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational st						
	С	C Demonstrate general but incomplete command of knowledge and skills required for attaining mo learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and knowledge to most familiar situations. Apply moderately effective organizational and presentational sl							
	D	outcon limited	nes. Show evidence of some coherent a	knowledge and skills required for attaining some of the course learning and logical thinking, but with limited analytical and critical abilities. Shower problems. Apply limited or barely effective organizational and					
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course I outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.							
Course Type	Lecture-ba	ased co	urse						
Course Teaching	Activities	S		Details		No. of Hours			
& Learning Activities	Lectures					36			
	Tutorials					12			
	Reading	/ Self st	udy			80			
Assessment Methods and Weighting	Methods		Details	Weighting in f		sment Methods to CLO Mapping			
	Assignme	ents			25 CLC	LO 1,2,3,4			
	Examination		2-hour written exam			1,2,3,4			
	Presenta	tion				1,2,3,4			
Required/recommended reading and online materials			vided by Course Coordinator How Things Work: The Physic	cs of Everyday Life (John Wiley & Son	ns, Inc, 2008, 3r			
Course Website	· ·	, nhveic	s.hku.hk/~phys1055/						

PHYS1056 Weather and cli	mate (6 credits)	Academic Year	2015
Offering Department	Physics	Quota	
Course Co-ordinator	Dr K M Lee, Physics (kmlee @lily.physics.hku.hk)		
Teachers Involved			

	Dr T C Le Dr P W Li	Dr K M Lee, Physics Dr T C Lee, Hong Kong Observatory Dr P W Li, Hong Kong Observatory Mr W K Wong, Hong Kong Observatory									
Course Objectives	introduce	to stude	nate play an important role in nts the fundamentals of weath echnological advancements.								
Course Contents & Topics	temperatu analysis, weather/o Experts fi weather climatolog										
Course Learning Outcomes	On succe	ssful cor	npletion of this course, student	ts shoul	ld be able to:						
	CLO 1 r	ecall the	basic principles of weather an	ıd clima	te						
		apply the	principles to interpret weather or media	/ clima	te information, for exan	nple from th	ne HKO web site,				
		dentify a	nd explain the differences of v	weathe	r and climate in Hong	Kong as co	ompared to other				
	CLO 4	explain th	ne basic causes of climate char	nge and	d its potential impacts						
	CLO 5 describe and discuss the daily operational activities in the HKO										
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL	NIL									
Offer in 2015 - 2016	Y 1st	Y 1st sem Examination Dec									
Offer in 2016 - 2017	Y										
Course Grade	A+ to F										
Grade Descriptors	A	course though effectiv	learning outcomes. Show strong ana t, and ability to apply knowledge to a re organizational and presentational sk								
	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least mo course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.						g, and ability to apply				
	С	learnin	g outcomes. Show evidence of some	command of knowledge and skills required for attaining most of the course some analytical and critical abilities and logical thinking, and ability to apply Apply moderately effective organizational and presentational skills.							
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the cours outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilit limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational skills.					critical abilities. Show					
	Fail	outcom	nstrate little or no evidence of commones. Lack of analytical and critical abilidge to solve problems. Organization a	ities, logi	cal and coherent thinking. Sh	now very little	or no ability to apply				
Course Type	Lecture-b	ased cou	ırse								
Course Teaching & Learning Activities	Activitie	s		Deta	ils		No. of Hours				
& Learning Activities	Lectures						36				
	Tutorials						12				
	Reading	/ Self stu	udy				80				
Assessment Methods and Weighting	Methods	5	Details		Weighting in final course grade (%)		ssment Methods to CLO Mapping				
	Assignm	ents			25	CLO 1,2,3,4,5					
	Examina	ition	2-hour written exam		50		1,3,4,5				
	Test				25	CLC	1,3,4,5				
Required/recommended reading and online materials			vided by Course Coordinator and Edward Tarbuck: The Atn	nosphe	re (Pearson Prentice H	all, 2013)					
Course Website	http://mod										

PHYS1057 Kitchen scien	ce (6 credits)	Academic Year	2015
Offering Department	Physics	Quota	
Course Co-ordinator	Prof A B Djurisic, Physics (dalek@hku.hk)		
Teachers Involved	Prof A B Djurisic, Physics		

Course Objectives			to improve students' understand cooking and to develop their c			behind the	common	daily activities	
Course Contents & Topics	The course will introduce basic scientific concepts and principles necessary to understand d methods of food preparation, as well as kitchen tools. The introduced concepts will be illustrated in and practical demonstrations. The topics include: basic food molecules (water, carbohydrates, fats, protein); foams and bubbles (various examples, beer, sodas, ice-cream); colloids, emulsions, gelation (vauces, jelly); crystallization (sugar, sugar syrups, honey, chocolate); taste and flavor (herbs, scooking processes and chemical reactions (Maillard reactions, caramelization, etc.); chemical reactirising dough with application to cakes, bread and cookies; fermentation (alcoholic beverages, ferr dairy products, tofu); pH values in cooking, natural and artificial food colorings, culinary curiomolecular gastronomy (novel flavors and textures); principles of operation of kitchen tools, such a stick cookware, pressure cookers, induction heating ranges, microwave ovens, etc.							elation (various herbs, spices) al reactions fo ges, fermented ary curiosities	
Course Learning Outcomes	On success	sful co	mpletion of this course, students	sho	uld be able to:				
	CLO 1 de	CLO 1 describe principles of operation of kitchen tools encountered in daily life							
	CLO 2 ex	plain b	pasic physical and chemical prod	cesse	es involved in food	d preparation			
	CLO 3 illu	ıstrate	how preparation method affects	the	flavor and texture	of food			
			common methods of food prepers in certain ways	aratio	on and understan	d scientific r	easons	for performing	
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL								
Offer in 2015 - 2016	N					Examination	n		
Offer in 2016 - 2017	N								
Course Grade	A+ to F								
Grade Descriptors	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	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	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course le outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational presentational skills.					cal abilities. Show		
	Fail	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course lea outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					no ability to apply		
Course Type	Lecture-bas	sed co	urse						
Course Teaching	Activities			Det	ails			No. of Hours	
& Learning Activities	Lectures							36	
	Tutorials			inlcuding demonstration (12 hours)		2	24		
	Reading /	Self st	udy					72	
Assessment Methods and Weighting	Methods		Details		Weighting in fi			nent Methods CLO Mapping	
	Assignmen	nts	essay & student presentations	;		70	CLO 1	,2,3,4	
	Examination	on				30	CLO 1	,2,3,4	
Required/recommended reading and online materials	T. Lister an S. T. Becke R. L. Wolke Peter Barh Inquisitive (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: Ti Inquisitive 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 Problem solvin	Academic Year	2015						
Offering Department	Physics	Quota						
Course Co-ordinator	Dr S Z Zhang, Physics (shizhong@hku.hk)	Dr S Z Zhang, Physics (shizhong@hku.hk)						
Teachers Involved	Dr S Z Zhang, Physics	Dr S Z Zhang, Physics						
Course Objectives	This course provides a basic training on the methods and tools the prepares students the necessary knowledge to learn the subject. Somethods and skills through tackling physical problems. Rudimenta	tudents will explore th	ne basic ideas,					

			lab will be introduced. It is e can be regarded as a sur			be followed by Methods		
Course Contents & Topics	its probl matrix of integration	This course introduces the principles and theories of various tools that are useful to read physics and s its problems. Topics include: Dimensional analysis, polynomials and complex numbers, rudimentar matrix operation, conic sections and topics related to practical calculus: limits, differentiation integration. Applications to physical systems and various practical problems solving skills are discus Whenever applicable, Matlab will be used to illustrate the topics discussed.						
Course Learning Outcomes	On succ	essful comple	etion of this course, studer	its should	be able to:			
	CLO 1	CLO 1 state physical systems by the language of mathematics and employ mathematical logic and reasoning to read physics						
	CLO 2	CLO 2 apply calculus to solve problems						
	CLO 3	CLO 3 review the features of various solving tools in physics as well as plan and select appropriate tools when solving physical problems						
	CLO 4		connections between mat	hematical	equations and physical	problems		
	CLO 5	formulate an	d operate physical probler	ns both qu	alitatively and quantitat	ively		
	CLO 6	interpret and	l judge the physical meani	ng of resul	t after calculations			
Pre-requisites (and Co-requisites and Impermissible combinations)	Students	s without Lev	KDSE Physics or equivale el 3 or above in HKDSE For this course.		t having a pass in PHY	'S1240 Physics by inqui		
Offer in 2015 - 2016	Y 2r	nd sem			Examina	tion May		
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all th course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of origina 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 observation skills and techniques. Critical us of data and results to draw appropriate and insightful conclusions.						
	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. Apply effective observation 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 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 outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical limited ability to apply knowledge to solve problems. Apply limited or barely effective orga presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and appropriate conclusions.						
	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. 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 laborato	ry component course					
Course Teaching	Activiti			Details	.	No. of Hours		
& Learning Activities	Lecture	S				3		
	Laborat	ory						
	Tutorial	s						
	Reading	g / Self study				8		
Assessment Methods and Weighting	Method	ls	Details		Weighting in final course grade (%)	Assessment Method		
	Assignr	nents			20	CLO 1,2,3,4,5,6		
	Examin		2-hour written exam		50	CLO 1,2,3,4,5		
		ory reports			10	CLO 3,5,6		
	Test	, -F 3.10			20	CLO 1,2,3,4,5		
Required/recommended	Lecture	Test 20 CLO 1,2,3,4,5 Lecture notes provided by Course Coordinator R. Shankar, Basic Training in Mathematics: A Fitness Program for Science, Springer, 1995						
reading and online materials	R. Shan	kar, Basic III	aining in Mathematics: A F	itness Pro	gram for Science, Sprin	ger, 1995		

PHYS1240 Physics by i	Academic Year	2015						
Offering Department	Physics	Quota						
Course Co-ordinator	Dr F K Chow, Physics (judychow@hku.hk)	Dr F K Chow, Physics (judychow@hku.hk)						

Teachers Involved	Dr F K Chow	Dr F K Chow, Physics						
Course Objectives		This course aims at providing students a solid background and knowledge in physics as well as its connection with our daily life phenomena and activities.						
Course Contents & Topics	differential a	The course has a general coverage in most physics topics and is conducted with no descriptions in differential and integral calculus. Emphasis will be stressed on the understanding of various physical phenomena in daily life through qualitative and simple quantitative analysis. The course contents cover Mechanics, Heat, Optics, Waves, Electricity and Magnetism.						
Course Learning Outcomes	On successf	ul completion of this of	course, students she	ould be able to:				
	CLO 1 des	scribe and distinguish	the concepts and p	orinciples in introducto	ory study of phy	sics		
	CLO 2 rec							
	CLO 3 exp	olain physical phenom	nena using proper p	hysical laws and the	ories			
	CLO 4 app	oly simple mathematic	cal techniques for q	uantitative analysis ir	solving physic	s problems		
	CLO 5 and	alyse data of physics	experiments					
Pre-requisites (and Co-requisites and Impermissible combinations)	PHYS1050 F	IIL lot for students with level 3 or above in HKDSE Physics; and Not for students who have passed in HYS1050 Physics for engineering students or already enrolled in this course; and lot for students who have passed in PHYS1250 Fundamental physics or already enrolled in this course.						
Offer in 2015 - 2016	Y 1st se	m		Ex	amination	Dec		
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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 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 learnin 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 an presentational skills.						
Course Type	Lecture-base	ed course						
Course Teaching	Activities		De	etails		No. of Hours		
& Learning Activities	Lectures					36		
	Tutorials					12		
	Reading / S	elf study				80		
Assessment Methods and Weighting	Methods	Details		Weighting in fina course grade (%		ssment Methods to CLO Mapping		
	Assignment	S		2	0 CLO	1,2,3,4,5		
	Examination	2-hour written	exam	5	0 CLC	1,2,3,4		
	Test			3	0 CLC	1,2,3,4		
Required/recommended reading and online materials	John D. Cuti Paul G. Hew	s provided by Course nell and Kenneth W itt: Conceptual Physic Serway and Chris Vu	Johnson: Introductions (Addison Wesley	, 2009, 11th edition)		c., 2013)		
Course Website	http://moodle	e.hku.hk						

PHYS1250 Fundamental p	Academic Year	2015								
Offering Department	Physics	Quota								
Course Co-ordinator	Dr M K Yip, Physics (mankit@bohr.physics.hku.hk)	Dr M K Yip, Physics (mankit@bohr.physics.hku.hk)								
Teachers Involved	Dr M K Yip (Sem 1), Physics Dr Y Tu (Sem 2), Physics									
Course Objectives	This course covers the fundamental blocks in physics in one ser students who are planning to take physics, astronomy, or mathem students who intend to take physics or astronomy as minor. Concep and the mathematical treatment is moderate.	atics/physics as majo	r. It also serves							
Course Contents & Topics	Topics include: Mechanics, Wave Motions, Geometric and Electromagnetism, and Modern Physics.	Physical Optics, T	hermodynamics,							

Course Learning Outcomes	On succ	essful comple	etion of this course, stud	lents should	be able to:			
	CLO 1	describe and	explain the fundamenta	al physical p	rinciples			
	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 mat	hematics			
	CLO 4	acquire and	interpret experimental d	ata to exam	ine the physical laws			
Pre-requisites (and Co-requisites and Impermissible combinations)	Students may be a Not for s	Level 3 or above in HKDSE Physics or equivalent; Students without Level 3 or above in HKDSE Physics but having a pass in PHYS1240 Physics by in nay be allowed to take this course; Not for students who have passed in PHYS1050 Physics for engineering students or already enrol his course.						
Offer in 2015 - 2016	Y 1s	st sem 2nd	sem		Examina	tion	Dec May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	course lear thought, an effective or	ning outcomes. Show strong d ability to apply knowledge	analytical and to a wide rang al skills. Apply	f extensive knowledge and sk critical abilities and logical th le of complex, familiar and ur highly effective lab skills and ns.	inking, wi ıfamiliar s	th evidence of original ituations. Apply highly	
	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.						
	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.							
	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	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 laborator	y component course					
Course Teaching	Activiti	es		Detail	s		No. of Hours	
& Learning Activities	Lecture						36	
	Laborat						6	
	Tutorial	•					8	
		Reading / Self study						
Assessment Methods and Weighting	Method	is	Details	'	Weighting in final course grade (%)	Asse	ssment Methods to CLO Mapping	
	Assignr	nents			10	C	CLO 1,2,3,4	
	Examin	ation	2-hour written exam		50		CLO 1,2,3	
	Laborat	tory reports			15		CLO 1,4	
	Test				25		CLO 1,2,3	
Required/recommended reading and online materials	Raymon edition)	d A. Serway	d by Course Coordinate and John W. Jewett: sics (Prentice Hall, 200	Physics for	r Scientists and Engine	ers (Th	nomson, 2011, 8th	
	Ja.1100 C		, (-, oanto	•••			

PHYS1650 Nature of the u	Academic Year	2015					
Offering Department	Physics Quota						
Course Co-ordinator	Dr K M Lee, Physics (kmlee @lily.physics.hku.hk)						
Teachers Involved	Dr K M Lee (Sem 1 and 2), Physics						
Course Objectives	This general education course is designed for students in all disciplines and all years. No prior knowledge in astronomy, physics, and higher mathematics is required, but will help.						
Course Contents & Topics	Topics covered include the observational aspect of astronomy (including constellations and planets), physics of our solar system, and our own Sun, stars and their evolution, galaxies, blackholes, cosmology. It also provides students with a basic understanding of the relationship of astronomy to life how our nature works on the macroscopic level. Students are expected to participate actively in the r sky observations.						

Course Learning Outcomes	On succ	essful cor	mpletion of this course, students	should be able to:				
	CLO 1	, .	and describe the major objects in and explain their main propert		d our universe	(including stars and		
	CLO 2	CLO 2 use the celestial sphere model to describe the apparent trajectories of celestial objects						
	CLO 3	review the evolution of the world-view from the geocentric model to the heliocentric model the discovery of the expansion of the universe on our world-view						
	CLO 4	of univer	antitative physical laws, includir sal gravitation, Doppler shift for nical problems					
	CLO 5	explain tl	ne evolution of stars and the evo	olution of the universe				
	CLO 6	commun and good	icate astronomical problems and English	nd solutions using app	propriate astron	nomical terminology		
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL	NIL						
Offer in 2015 - 2016	Y 1:	st sem 2	2nd sem	I	Examination	Dec May		
Offer in 2016 - 2017	Y							
Course Grade	A+ to F							
Grade Descriptors	A	course though effective	nstrate thorough mastery at an advance learning outcomes. Show strong analyst, and ability to apply knowledge to a ve organizational and presentational skip and results to draw appropriate and instructions.	rtical and critical abilities an wide range of complex, fam Ils. Apply highly effective ob-	d logical thinking, i iliar and unfamiliar	with evidence of original situations. Apply highly		
	В	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to ap knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. Ap effective observation skills and techniques. Correct use of data of results to draw appropriate conclusions.						
	С	learnin knowle moder	ng outcomes. Show evidence of some edge to most familiar situations. Apply	mmand of knowledge and skills required for attaining most of the course ome analytical and critical abilities and logical thinking, and ability to apply Apply moderately effective organizational and presentational skills. Apply id techniques. Mostly correct but some erroneous use of data and results to				
	D	outcon limited preser	nstrate partial but limited command of lines. Show evidence of some coherent a ability to apply knowledge to solvitational skills. Apply partially effective of appropriate conclusions.	and logical thinking, but with re problems. Apply limited	limited analytical ar I or barely effect	nd critical abilities. Show tive organizational and		
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learni outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to app knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. App minimally effective or ineffective observation skills and techniques. Misuse of data and results and/or unable to dra appropriate conclusions.							
Course Type	Lecture	with labor	atory component course					
Course Teaching	Activiti			Details		No. of Hours		
& Learning Activities	Lecture	es				36		
	Labora	tory				12		
	Tutoria	ls				8		
	Readin	g / Self st	udy			64		
Assessment Methods and Weighting	Method	ds	Details	Weighting in fi		sessment Methods to CLO Mapping		
	Assignr	ments			` ,	O 1,2,3,4,5,6		
	Examin		2-hour written exam			O 1,2,3,4,5,6		
	Presen	tation				CLO 1,6		
Required/recommended reading and online materials	E. Chais	sson and S	S. McMillan: Astronomy Today (Pearson, 2011)	·			
Course Website	http://mo	odle.hku.	hk					

PHYS2055 Introduction to	Academic Year	2015						
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 course aims at introducing students the essence of special rela students in all disciplines and all years with science background.	This course aims at introducing students the essence of special relativity. It is designed as an elective for students in all disciplines and all years with science background.						
Course Contents & Topics	time, Examples of time dilation and space contraction, Paradoxes	Topics include: "Common-sense" concepts of space and time versus Einstein's conceptions of space an time, Examples of time dilation and space contraction, Paradoxes of relativity including the famous twi paradox and the "pole-in-the-barn", Four vectors and Lorentz invariant.						

Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1	recall	the setup and significance of Mi	chelson-Morley experi	ment			
	CLO 2	state the basic postulates and the spacetime concept of special relativity						
	CLO 3	explain time dilation and length contraction						
	CLO 4	describe Lorentz transformation and its applications						
	CLO 5	state t	the resolution of the twin and po	le-in-the-barn paradoxe	es			
Pre-requisites (and Co-requisites and Impermissible combinations)		ass in PHYS1250 Fundamental physics or PHYS1150 Problem solving in physics or PHYS1050 Por engineering students						
Offer in 2015 - 2016	Y 2nd	d sem		I	Examination	May		
Offer in 2016 - 2017	Υ					'		
Course Grade	A+ to F							
Grade Descriptors	A	course	onstrate thorough mastery at an advance e learning outcomes. Show strong anale ht, and ability to apply knowledge to a live organizational and presentational ski	ytical and critical abilities an wide range of complex, fam	nd logical thinking, v	with evidence of original		
	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 appl 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.							
		limited	d ability to apply knowledge to solv		limited analytical ar	nd critical abilities. Show		
	Fail	limited preser Demo outcor	d ability to apply knowledge to solv	nd of knowledge and skills ies, logical and coherent thi	limited analytical ard or barely effect required for attain inking. Show very limited and the state of the st	nd critical abilities. Show tive organizational and ning the course learning title or no ability to apply		
Course Type	Fail Lecture-b	Demo outcor knowle	d ability to apply knowledge to solvatational skills. Instrate little or no evidence of comma mes. Lack of analytical and critical abilit edge to solve problems. Organization ar	nd of knowledge and skills ies, logical and coherent thi	limited analytical ard or barely effect required for attain inking. Show very limited and the state of the st	nd critical abilities. Show tive organizational and ning the course learning title or no ability to apply		
Course Teaching		Demo outcor knowle	d ability to apply knowledge to solvatational skills. Instrate little or no evidence of comma mes. Lack of analytical and critical abilit edge to solve problems. Organization ar	nd of knowledge and skills ies, logical and coherent thi	limited analytical ard or barely effect required for attain inking. Show very limited and the state of the st	nd critical abilities. Show tive organizational and ning the course learning title or no ability to apply		
Course Teaching	Lecture-b	Demo outcor knowle ased co	d ability to apply knowledge to solvatational skills. Instrate little or no evidence of comma mes. Lack of analytical and critical abilit edge to solve problems. Organization ar	ve problems. Apply limited and of knowledge and skills ies, logical and coherent thi and presentational skills are m	limited analytical ard or barely effect required for attain inking. Show very limited and the state of the st	nd critical abilities, Show tive organizational and hing the course learning ttle or no ability to apply r ineffective.		
Course Teaching	Lecture-b	limited preser Demo outcor knowle ased co	d ability to apply knowledge to solvatational skills. Instrate little or no evidence of comma mes. Lack of analytical and critical abilit edge to solve problems. Organization ar	ve problems. Apply limited and of knowledge and skills ies, logical and coherent thi and presentational skills are m	limited analytical ard or barely effect required for attain inking. Show very limited and the state of the st	nd critical abilities. Show tive organizational and hing the course learning title or no ability to apply r ineffective. No. of Hours		
Course Teaching	Lecture-b Activitie Lectures	Demo outcor knowle	d ability to apply knowledge to solvatational skills. Instrate little or no evidence of comma mes. Lack of analytical and critical ability edge to solve problems. Organization are ourse	ve problems. Apply limited and of knowledge and skills ies, logical and coherent thi and presentational skills are m	limited analytical ard or barely effect required for attain inking. Show very limited and the state of the st	nd critical abilities. Show tive organizational and and ting the course learning title or no ability to apply r ineffective. No. of Hours 36		
Course Teaching & Learning Activities Assessment Methods	Lecture-b Activitie Lectures Tutorials	limited preser Demo outcor knowle assed co	d ability to apply knowledge to solvatational skills. Instrate little or no evidence of comma mes. Lack of analytical and critical ability edge to solve problems. Organization are ourse	ve problems. Apply limited and of knowledge and skills ies, logical and coherent thind presentational skills are markets. Details Weighting in fi	limited analytical ard or barely effect required for attain inking. Show very lininimally effective or	nd critical abilities, Show tive organizational and hing the course learning ttle or no ability to apply r ineffective. No. of Hours 36 12		
Course Teaching & Learning Activities Assessment Methods	Lecture-b Activitie Lectures Tutorials Reading Methods	limited preser Demo outcor knowle assed co	d ability to apply knowledge to solvatational skills. Instrate little or no evidence of comma mes. Lack of analytical and critical ability edge to solve problems. Organization are purse	ve problems. Apply limited and of knowledge and skills ies, logical and coherent thind presentational skills are materials.	limited analytical ard or barely effect required for attain inking. Show very lininimally effective or lininimally effective or lininimally effective of lininimal lin	nd critical abilities. Show tive organizational and and hing the course learning title or no ability to apply r ineffective. No. of Hours 36 12 80 sessment Methods		
Course Teaching & Learning Activities Assessment Methods	Lecture-b Activitie Lectures Tutorials Reading	limited preser Demo outcome knowled limited preser limited preserved limited preserved limited limited limited preserved limited limit	d ability to apply knowledge to solvatational skills. Instrate little or no evidence of comma mes. Lack of analytical and critical ability edge to solve problems. Organization are purse	ve problems. Apply limited and of knowledge and skills ies, logical and coherent thind presentational skills are markets. Details Weighting in fi	limited analytical ard or barely effect required for attain inking. Show very lininimally effective or similar to the control of the control	nd critical abilities. Show tive organizational and and and ting the course learning title or no ability to apply r ineffective. No. of Hours 36 12 80 sessment Methods to CLO Mapping CLO 2,4		
Course Teaching & Learning Activities Assessment Methods	Lecture-b Activitie Lectures Tutorials Reading Methods Assignm	limited preser Demo outcome knowled limited preser limited preserved limited preserved limited limited limited preserved limited limit	d ability to apply knowledge to solventational skills. Instrate little or no evidence of comma mes. Lack of analytical and critical abilitiedge to solve problems. Organization are purse	ve problems. Apply limited and of knowledge and skills ies, logical and coherent thind presentational skills are markets. Details Weighting in fi	limited analytical ard or barely effect required for attain inking. Show very liminimally effective or similar required for attain inking. Show very liminimally effective or similar required for attaining liminal (%) Ass (%) 25 50 CL	nd critical abilities. Show tive organizational and organizational and organizational and organizational and organizational and organizational and organization or no ability to apply r ineffective. No. of Hours 36 12 80 sessment 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 Test Lecture n Robert R Pub., 199 Edwin F.	limited preser Demo outcome Assed co outcome Asset co out	d ability to apply knowledge to solventational skills. Instrate little or no evidence of comma mes. Lack of analytical and critical abilitiedge to solve problems. Organization are purse	re problems. Apply limited and of knowledge and skills ies, logical and coherent thind presentational skills are market and presentational skills are market an	limited analytical ard or barely effect required for attain inking. Show very liminimally effective or similar required for attain inking. Show very liminimally effective or similar required for attain inking. Show very liminimally effective or similar required for similar required for a similar required for a similar required for attain inking. Show very liminimally effective or similar required for similar required for attain inking.	nd critical abilities. Show tive organizational and aning the course learning title or no ability to apply r ineffective. No. of Hours 36 12 80 sessment Methods to CLO Mapping CLO 2,4 .O 1,2,3,4,5 .O 1,2,3,4,5		

PHYS2150 Methods in phy	sics I (6	credits)	Academic Year	2015					
Offering Department	Physics	Physics Quota							
Course Co-ordinator	Dr F K (Dr F K Chow, Physics (judychow@hku.hk)							
Teachers Involved	Dr F K (r F K Chow, Physics							
Course Objectives		nis course provides students with experience in using mathematical tools and techniques to solve roblems in physics. It is complete in itself, or may also be followed by Methods in Physics II.							
Course Contents & Topics	particle dimensi of multi Cartesia	is of ordinary differential equations in first, second and his dynamics, circuit theories and nuclear physics; Principles cons; Vector functions; Cartesian, cylindrical and spherical cocyariable functions and the Taylor series in two-variable furan, cylindrical and spherical coordinates; Change of variable of mass, moments of inertia, and electric potentials.	of vectors; Analytic go ordinates; Partial deriv nctions; Double and t	eometry in three atives, extremes riple integrals ir					
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1	CLO 1 review the theory and principles of mathematical methods and compare the features of various methods							
	CLO 2	CLO 2 describe the connections between mathematical equations and physical problems							
	CLO 3	CLO 3							

		state and systems	d set up mathematical equa	tions to describe	the dynamics	and evolu	ution of physics	
	CLO 4	demonst	rate knowledge of choosing co	orrect solution of I	mathematical e	quations		
	CLO 5	interpret	and judge the physical meani	ng of result after o	calculations			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in PHYS1150 Problem solving in physics or MATH1011 University mathematics I or MATH1013 University mathematics II or MATH1851 Calculus and ordinary differential equations							
Offer in 2015 - 2016	Y 1s	st sem		Examin	nation	Dec		
Offer in 2016 - 2017	Υ						'	
Course Grade	A+ to F							
Grade Descriptors	A	course	e learning outcomes. Show strong an	oilities and logical	owledge and skills required for attaining all the s and logical thinking, with evidence of original tions. Apply highly effective organizational and			
	В	B Demonstrate substantial command of a broad range of knowledge ar course learning outcomes. Show evidence of analytical and critical knowledge to familiar and some unfamiliar situations. Apply effective				abilities and logical thinking, and ability to apply		
	С	C Demonstrate general but incomplete command of knowledge and learning outcomes. Show evidence of some analytical and critical a knowledge to most familiar situations. Apply moderately effective organizations.				bilities and logical thinking, and ability to apply		
	D Demonstrate partial but limited command of knowledge a outcomes. Show evidence of some coherent and logical the limited ability to apply knowledge to solve problems presentational skills.			t and logical thinking,	but with limited an	alytical and c	ritical abilities. Show	
		Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course I outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability the knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
	Fail	outcon	nes. Lack of analytical and critical ab	ilities, logical and coh	erent thinking. She	ow very little	or no ability to apply	
Course Type		outcon	nes. Lack of analytical and critical ab edge to solve problems. Organization	ilities, logical and coh	erent thinking. She	ow very little	or no ability to apply	
Course Teaching		outcon knowled	nes. Lack of analytical and critical ab edge to solve problems. Organization	ilities, logical and coh	erent thinking. She	ow very little	or no ability to apply	
Course Teaching	Lecture-k	outcon knowled based con	nes. Lack of analytical and critical ab edge to solve problems. Organization	ilities, logical and coh and presentational sk	erent thinking. She	ow very little	or no ability to apply ffective.	
Course Teaching	Lecture-b	outcon knowled based con es	nes. Lack of analytical and critical ab edge to solve problems. Organization	ilities, logical and coh and presentational sk	erent thinking. She	ow very little	or no ability to apply ffective.	
	Lecture-b Activitie Lectures Tutorials	outcon knowled based con es	nes. Lack of analytical and critical ab adge to solve problems. Organization urse	ilities, logical and coh and presentational sk	erent thinking. She	ow very little	or no ability to apply ffective. No. of Hours	
Course Teaching	Lecture-b Activitie Lectures Tutorials	outconknowle	nes. Lack of analytical and critical ab adge to solve problems. Organization urse	ilities, logical and cot and presentational sk Details Weightii	erent thinking. She	ow very little of infective or ine	No. of Hours 36	
Course Teaching & Learning Activities Assessment Methods	Lecture-t Activitie Lectures Tutorials Reading	outcon knowle based con es s s s g / Self str	nes. Lack of analytical and critical ab adge to solve problems. Organization urse	ilities, logical and cot and presentational sk Details Weightii	ng in final	Assess	No. of Hours 36 12 80 sment Methods	
Course Teaching & Learning Activities Assessment Methods	Lecture-t Activitie Lectures Tutorials Reading Method	outcon knowle based colleges s s s g / Self str	nes. Lack of analytical and critical ab adge to solve problems. Organization urse	ilities, logical and cot and presentational sk Details Weightii	ng in final grade (%)	Assess	No. of Hours 36 12 80 sment Methods o CLO Mapping	
Course Teaching & Learning Activities Assessment Methods	Lecture-th Activitie Lectures Tutorials Reading Method Assignm	outcon knowle based colleges s s s g / Self str	nes. Lack of analytical and critical abadge to solve problems. Organization urse Urse Details	ilities, logical and cot and presentational sk Details Weightii	ng in final grade (%)	Assess to CLO	No. of Hours No. of Hours 36 12 80 sment Methods of CLO Mapping 1,2,3,4,5	
Course Teaching & Learning Activities Assessment Methods	Lecture-th Activitie Lectures Tutorials Reading Method Assignm Examina Test Lecture r J. Hass, edition) M. R. Sp 2009 Susan J. K. F. Rii	outcon knowle based cooles s s s s s y / Self structure strong motes pro M. D. W piegel: S . Colley: \ Colley: \ . Colley: \ . Colley: \ . Eley, M. F.	nes. Lack of analytical and critical abadge to solve problems. Organization urse Urse Details	Details Weighticourse Mathematics for 1, 4th edition) Mathematical I	ng in final grade (%) 15 50 35 arly Transcend or Engineers a	Assess to CLO CLO CLO dentals (Peand Scientis	No. of Hours 36 12 80 sment Methods o CLO Mapping 1,2,3,4,5 0 2,3,4 1,2,3,4 arson, 2014, 2nd sts (McGraw-Hill,	

PHYS2155 Methods in phy	Academic Year	2015					
Offering Department	Physics		Quota				
Course Co-ordinator	Dr F C C Ling, Physics (ccling@hku.hk)						
Teachers Involved	Dr F C C Ling, Physics						
Course Objectives	This course provides students with experience in using mathematical tools and techniques to solve problems in physics. It is complete in itself, or may also be taken after Methods in Physics I.						
Course Contents & Topics	A review on coordinate systems in three dimensions; Gradient, divergence, curl and Laplacian; Line integrals, surface integrals and volume integrals; Conservative fields and potentials; Green's theorem, divergence theorem and the Stokes' theorem; Curvilinear coordinates; Applications of vector calculus in classical mechanics and electrodynamics; Vector spaces and matrix algebra; Properties of some special matrices: Hermitian matrices and unitary matrices, etc; Quadratic forms; Eigenvalue problems and diagonalization of matrices; Applications of matrix theory in physical problems; Numerical methods for finding roots of equations; Numerical differentiation and integration.						
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1	review the theory and principles of mathematical methods methods	nd compare the features of various				
	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 physic systems					

	CLO 4 demoi	strate knowledge of choosing co	rect solution of mathema	ilicai equalions					
	CLO 5 solve v	various problems and operate the	calculations with comput	ter					
	CLO 6 interpr	et and judge the physical meanin	g of result after calculatio	ons					
Pre-requisites (and Co-requisites and Impermissible combinations)		ass in PHYS1150 Problem solving in physics or MATH1011 University mathematics I or MATH niversity mathematics II or MATH1851 Calculus and ordinary differential equations							
Offer in 2015 - 2016	Y 2nd sem		E	xamination	May				
Offer in 2016 - 2017	Υ		'						
Course Grade	A+ to F								
Grade Descriptors	cou	monstrate thorough mastery at an advan- rse learning outcomes. Show strong ana ught, and ability to apply knowledge to fai sentational skills.	lytical and critical abilities and	logical thinking, with	evidence of original				
	cou	nonstrate substantial command of a broad rse learning outcomes. Show evidence of wledge to familiar and some unfamiliar sit	of analytical and critical abilities	and logical thinking,	and ability to apply				
	lear								
	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.								
	outo	nonstrate little or no evidence of commo comes. Lack of analytical and critical abil wledge to solve problems. Organization a	ities, logical and coherent think	ting. Show very little o	r no ability to apply				
Cauraa Tuna	Lecture-based	course							
Course Type	Ecolare basea (
Course Teaching	Activities		Details		No. of Hours				
••			Details		No. of Hours				
Course Teaching	Activities		Details						
Course Teaching	Activities Lectures	study	Details		36				
Course Teaching	Activities Lectures Tutorials	study Details	Details Weighting in fine course grade (%)		36 12				
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Tutorials Reading / Self		Weighting in fine course grade (%	%) to	36 12 80 ment Methods				
Course Teaching & Learning Activities	Activities Lectures Tutorials Reading / Self Methods		Weighting in fine course grade (%	(6) to	36 12 80 ment Methods CLO Mapping				
Course Teaching & Learning Activities	Activities Lectures Tutorials Reading / Self Methods Assignments	Details	Weighting in fine course grade (%	6) to 15 CLO 1,: 50 CLO	36 12 80 sment Methods o CLO Mapping 2,3,4,5,6				
Course Teaching & Learning Activities	Activities Lectures Tutorials Reading / Self Methods Assignments Examination Test Lecture notes p Riley K.F., Hob 2006, 3rd editio	Details 2-hour written exam rovided by Course Coordinator son M.P. and Bence S.J.: Mathe	Weighting in fina course grade (%) 1 5 3 matical Methods for Physical stress of the stress of th	60 CLO 1,35 CLO 1,35 CLO Sics and Engineer	36 12 80 sment Methods o CLO Mapping 2,3,4,5,6 2,3,4 2,3,4				

PHYS2250 Introductory me	echanics	(6 credits)	Academic Year	2015					
Offering Department	Physics		Quota						
Course Co-ordinator	Dr M K Yip, Physics (mankit@bohr.physics.hku.hk)								
Teachers Involved		Dr M K Yip (Sem 1), Physics Prof J Gao (Sem 2), Physics							
Course Objectives	who are	arse covers the foundation of mechanics in one semester. It is planning to take physics, astronomy, or mathematics/physend to take physics as minor. Both conceptual ideas and matized.	ics as major. It also s	serves students					
Course Contents & Topics	Conserv Angular Harmon	nclude: Kinematics, Newton's Laws of Motion and Their Apration, Variable Mass Problems, System of Particles and Commentum and its Conservation, Work, Energy and its ic Motions, Fluid Static and Pressure, Archimedes' Principle Tension and Capillary Tube.	entre of Mass, Torque s Conservation, Grav	e and Rotation, vitation, Simple					
Course Learning Outcomes	On succ	essful completion of this course, students should be able to:							
	CLO 1	describe and explain the fundamental physical principles							
	CLO 2	apply these principles, together with logical and mathema physical world	tical reasoning, to sit	uations of the					
	CLO 3	analyse and solve problems with the aids of mathematics							
	CLO 4	acquire and interpret experimental data to examine the physic	cal laws						
	Pass in	PHYS1250 Fundamental physics or PHYS1050 Physics for e	ngineering students						

Pre-requisites (and Co-requisites and Impermissible combinations)						
Offer in 2015 - 2016	Y 1st	sem 2nd	sem		Examina	tion De	ec May
Offer in 2016 - 2017	Υ				'		
Course Grade	A+ to F						
Grade Descriptors	A	course lea thought, as effective of	rning outcomes. Show strend ability to apply knowled	ong analytical and lge to a wide ran tional skills. Appl	of extensive knowledge and sl d critical abilities and logical th ge of complex, familiar and ur y highly effective lab skills and ons.	inking, with evider familiar situations	nce of original . Apply highly
	В	course lea knowledge	rning outcomes. Show evi to familiar and some unfa	dence of analytic amiliar situations.	f knowledge and skills required al and critical abilities and logi Apply effective organizational of results to draw appropriate of	cal thinking, and a and presentationa	ability to apply
	С	learning or knowledge moderately	atcomes. Show evidence to most familiar situation of effective lab skills and to	of some analyticans. Apply modera	nowledge and skills required fi al and critical abilities and logi- ately effective organizational a or correct but some erroneous	cal thinking, and a and presentationa	bility to apply I skills. Apply
	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. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.					
	Fail	outcomes. knowledge minimally	Lack of analytical and crit to solve problems. Orga	ical abilities, logion nization and pre-	nowledge and skills required for cal and coherent thinking. Show sentational skills are minimall nniques. Misuse of data and	v very little or no a y effective or inef	ability to apply fective. Apply
Course Type	Lecture wi	th laborato	ry component course				
Course Teaching	Activities	•		Detai	ils	No	o. of Hours
& Learning Activities	Lectures						36
	Laborator	rv					6
	Tutorials	,					8
	Reading /	Reading / Self study					80
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Assessmer to CL	nt Methods O Mapping
	Assignme	ents			10	CLO 1,2	2,3,4
	Examinat	ion	2-hour written exan	າ	50	CLO 1,	2,3
	Laborator	ry reports			15	CLO 1	,4
	Test				25	CLO 1,	2,3
	Looturo no	ntes provide	ed by Course Coordin	ator			
Required/recommended reading and online materials	P.A Tipler	and G. Mo	sca: Physics for Scie	ntists and Eng	gineers, (Freeman, 2008, n to Mechanics (McGra	,	nternationa

PHYS2255 Introductory ele	and magnetism (6 credits)	Academic Year	2015							
Offering Department	Physics	Physics Quota								
Course Co-ordinator	Dr J C S	Or J C S Pun, Physics (jcspun@hku.hk)								
Teachers Involved	Dr J C S	S Pun, Physics								
Course Objectives	for students	urse covers the foundation of electricity and magnetism in one ents who are planning to take physics, astronomy, or mathen is who intend to take physics as minor. Both conceptual ity and magnetsim are emphasized.	natics/physics as maj	or. It also serves						
Course Contents & Topics	conduct	nclude: Vector notation and vector field, Electric force and ors, Electric potential energy and potential, Capacitance and raday's law of induction, Inductance, AC circuit, Maxwell's equal to the control of the contr	DC circuits, Magnetic	c force, Magnetic						
Course Learning Outcomes	On succ	essful completion of this course, students should be able to:								
	CLO 1	describe and explain the fundamental physical principles								
	CLO 2	apply these principles, together with logical and mathema physical world	atical reasoning, to s	situations of the						
	CLO 3	analyse and solve problems with the aids of mathematics								
	CLO 4	acquire and interpret experimental data to examine the phys	ical laws							
	Pass in	PHYS1250 Fundamental physics or PHYS1050 Physics for e	ngineering students							

Pre-requisites (and Co-requisites and Impermissible combinations)	,							
Offer in 2015 - 2016	Y 2nd	sem			Examina	tion	May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	course lea thought, an effective of	rning outcomes. Show str nd ability to apply knowled	ong analytical and Ige to a wide rand tional skills. Apply	of extensive knowledge and shad critical abilities and logical the ge of complex, familiar and ure highly effective lab skills and ons.	inking, with ev familiar situati	idence of original ons. Apply highly	
	В	course lea knowledge	rning outcomes. Show evi to familiar and some unf	dence of analytica amiliar situations.	knowledge and skills required al and critical abilities and logi Apply effective organizational of results to draw appropriate of	cal thinking, ar and presentat	nd ability to apply	
	С	learning or knowledge moderately	tcomes. Show evidence to most familiar situation effective lab skills and to	of some analytica ns. Apply modera	owledge and skills required for I and critical abilities and logical ately effective organizational a correct but some erroneous or the correct but some erroneous or correct errore correct error	al thinking, ar and presentation	d ability to apply onal skills. Apply	
	D	appropriate conclusions. Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learnin 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 an presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to draw appropriate conclusions.						
	Fail	outcomes. knowledge minimally	Lack of analytical and crit to solve problems. Orga	ical abilities, logic nization and pres	owledge and skills required for al and coherent thinking. Show sentational skills are minimally niques. Misuse of data and	v very little or i	no ability to apply ineffective. Apply	
Course Type	Lecture wit	h laborato	ry component course					
Course Teaching	Activities			Detai	etails No. of Hours			
& Learning Activities	Lectures				-		36	
	Laborator	v					6	
	Tutorials	,					8	
		Self study					80	
Assessment Methods and Weighting	Methods		Details	,	Weighting in final course grade (%)		nent Methods CLO Mapping	
	Assignme	nts			10	CLO	1,2,3,4	
	Examinati	on	2-hour written exam	า	50	CLC	1,2,3	
	Laboratory	y reports			15	CL	O 1,4	
	Test				25	CLC	1,2,3	
D	P. A. Tipler		,		gineers (Freeman, 2008,	6th edition)		
Required/recommended reading and online materials	R. Resnick	, D. Hallida	•	sics Volume 2	son, 2008, 2nd edition) 2 (John Wiley and Sons, Engineers (Thomson, 200	,	,	

PHYS2260 Heat and waves	(6 credits)	Academic Year	2015				
Offering Department	Physics	Quota					
Course Co-ordinator	Dr F C C Ling, Physics (ccling@hku.hk)	<u>'</u>	·				
Teachers Involved	Dr F C C Ling, Physics						
Course Objectives	This course covers the foundation of heat and waves in students who are planning to take physics, astronomy, students who intend to take physics as minor. Both concand waves are emphasized.	or mathematics/physics as majo	or. It also serves				
Course Contents & Topics	Topics include: type of waves; Sinusoidal wave including through a stretched string as an example for transverse wave, Wave equation, Energy in wave motion, The pr Standing waves and resonance, Beats, The Doppler E Reflection, Refraction, Double slit interference, Interferen slit and grating, Polarization, Temperature and equilibric Mean free path, distributions of molecular speed and ener Work done on or by an ideal gas, Internal energy of an ideand constant pressure, Different thermodynamic procevolume, cyclical and free expansion, Reversibility of proceof thermodynamic, Carnot engine, Statistical view of entrop	wave, Sound wave as an example inciple of superposition, Interference from thin films, Single slit difficum, Ideal gas law, Molecular virgy, Concept of heat, First law of eal gas, Molar heat capacities at easses including adiabatic, isotheass, definition of entropy change,	e for longitudinal rence of waves, magnetic wave, fraction, Multiple iew of pressure, thermodynamic, constant volume ermal, constant-				
	On successful completion of this course, students should be able to:						
Course Learning Outcomes	On successful completion of this course, students should be	be able to:					

		apply these physical wor		h logical a	nd mathematical reaso	ning, to situations of the			
	CLO 3	analyse and	solve problems with the	aids of mat	hematics				
	CLO 4	acquire and	interpret experimental da	ata to exam	ine the physical laws				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in I	PHYS1250 F	undamental physics or F	PHYS1050 Physics for engineering students					
Offer in 2015 - 2016	Y 1s	st sem			Examina	ation Dec			
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A								
	В	course lear knowledge	rning outcomes. Show evidend to familiar and some unfamili	ce of analytica ar situations.	I and critical abilities and logi Apply effective organizational	for attaining at least most of th ical thinking, and ability to appl and presentational skills. Appl conclusions.			
	С	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 coul learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to ap knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Ap moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to drappropriate conclusions.							
	D	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilitie limited ability to apply knowledge to solve problems. Apply limited or barely effective organizatio presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results appropriate conclusions.							
	Fail	outcomes. knowledge minimally	Lack of analytical and critical to solve problems. Organiza	abilities, logica	al and coherent thinking. Show entational skills are minimall	or attaining the course learnin w very little or no ability to appl y effective or ineffective. Appl results and/or unable to draw			
Course Type	Lecture	with laborator	ry component course						
Course Teaching	Activiti	es		Details No. of H					
& Learning Activities	Lecture			- Dotain		3			
	Laborat								
	Tutorial	•							
		g / Self study							
Assessment Methods		•							
and Weighting	Method	is	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignn	ments			10	CLO 1,2,3,4			
	Examin	ation	2-hour written exam		50	CLO 1,2,3			
	Laborat	tory reports			15	CLO 1,4			
	Test				25	CLO 1,2,3			
Required/recommended reading and online materials	R. Resni	ick, D. Hallida	osca: Physics for Scienti ay, and K. Krane: Physic ay, and K. Krane: Physic	s Volume 1	(John Wiley and Sons,	2002, 5th edition)			

PHYS2265 Modern physics	Academic Year	2015						
Offering Department	Physics	Physics Quota						
Course Co-ordinator	Dr F K (Dr F K Chow, Physics (judychow@hku.hk)						
Teachers Involved		F Chau (Sem 1), Physics Chow (Sem 2), Physics						
Course Objectives	students	urse covers the foundation of modern physics in one seme s who are planning to take physics, astronomy, or mathema s who intend to take physics as minor. Both conceptual ic physics are emphasized.	itics/physics as major	. It also serves				
Course Contents & Topics		nclude: Particle Properties of Wave, Wave Properties of Particles to Time Independent Schrodinger Equation, The Hydrog						
Course Learning Outcomes	On succ	sessful completion of this course, students should be able to:						
	CLO 1	describe and explain the fundamental physical principles						
	CLO 2	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 a	CLO 4 acquire and interpret experimental data to examine the physical laws								
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in PHYS1250 Fundamental physics or PHYS1050 Physics for engineering students								
Offer in 2015 - 2016	Y 1st	Y 1st sem 2nd sem Examina						May		
Offer in 2016 - 2017	Y	Υ								
Course Grade	A+ to F									
Grade Descriptors	A	course lea thought, as effective of	te thorough mastery at an adv rning outcomes. Show strong and ability to apply knowledge to rganizational and presentations to draw appropriate and insigh	analytical and to a wide rang al skills. Apply	critical abilities and logical the of complex, familiar and unhighly effective lab skills and	ninking, with nfamiliar siti	evidence uations. A	of original opply highly		
	В	course lea knowledge	ate substantial command of a bi rning outcomes. Show evidence to familiar and some unfamilia b skills and techniques. Correc	ce of analytica ar situations.	I and critical abilities and log Apply effective organizational	ical thinking and preser	, and abili ntational s	ity to apply		
	С	learning or knowledge moderately	ate general but incomplete con atcomes. Show evidence of so to most familiar situations. A deflective lab skills and technic e conclusions.	ome analytical Apply moderat	and critical abilities and logitely effective organizational	cal thinking and presen	, and abili tational sl	ity to apply kills. Apply		
	D	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities limited ability to apply knowledge to solve problems. Apply limited or barely effective organization presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results appropriate conclusions.								
	Fail	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable appropriate conclusions.						ity to apply tive. Apply		
		appropriate	e conclusions.		,	results and	a/OI UIIADI	le to draw		
Course Type	Lecture wi		e conclusions. ry component course			Todalo an	a/or unab	le to draw		
Course Teaching	Lecture wi	th laborato		Detail		Todalo una				
7.		th laborato						of Hours		
Course Teaching	Activities	th laborato						of Hours 36		
Course Teaching	Activities Lectures	th laborato						of Hours 36 6		
Course Teaching	Activities Lectures Laborator Tutorials	th laborato	ry component course					of Hours 36 6 8		
Course Teaching	Activities Lectures Laborator Tutorials	th laborato s y / Self study	ry component course			Asses	No. o			
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborator Tutorials Reading	th laborato s y // Self study	ry component course		s Weighting in final	Asses	No. o	of Hours 36 6 8 80 Methods Mapping		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborator Tutorials Reading	th laborato s Ty / Self study	ry component course		Weighting in final course grade (%)	Assess t	No. o	of Hours 36 6 8 80 Methods Mapping		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborator Tutorials Reading / Methods Assignment	th laborato s y / Self study ents ion	ry component course Details		Weighting in final course grade (%)	Asses t CL	No. o	of Hours 36 6 8 80 Methods Mapping ,4		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborator Tutorials Reading / Methods Assignment	th laborato s y / Self study ents ion	ry component course Details		Weighting in final course grade (%)	Asses t CL	No. c sment o CLO 0 1,2,3	of Hours 36 6 8 80 Methods Mapping ,4		
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Laborator Tutorials Reading / Methods Assignme Examinat Laborator Test Lecture no R. Harris: K. Krane: R. A. Serw P. A. Tiple edition)	th laborato S Ty / Self study ents ion ry reports otes provide Modern Ph way, C. J. N er and G.	ry component course Details	r and edition) s, 2012, 3rd Modern Phynntists and	Weighting in final course grade (%) 10 50 15 25 I edition) sics (Brooks Cole, 2000-Engineers Extended Veighting in final	Asses t CL C C 4, 3rd edit	Sment I o CLO I	of Hours 36 8 80 Methods Mapping ,4 3		

PHYS2850 Atomic and nuc	clear phy	sics (6 credits)		Academic Year	2015			
Offering Department	Physics	Physics Quota							
Course Co-ordinator	Dr S Z Z	Dr S Z Zhang, Physics (shizhong@hku.hk)							
Teachers Involved	Dr S Z Z	Zhang, Physics							
Course Objectives	It aims topics of	to provide a cohor of current research	e students to the fundamen erent and concise coverag n interest will be also discus zation of Bose-Einstein con	ge of traditional atc ssed, such as laser	omic and nuclear ph cooling and trapping	ysics. Important			
Course Contents & Topics	electron	magnetic field, spens. Applications of	structure of hydrogen ar ectroscopy, laser trapping a of the basic principles of	and cooling; nuclea	ar structure, shell mo	del and nuclear			
Course Learning Outcomes	On succ	cessful completion	n of this course, students sh	nould be able to:					
	CLO 1		onsiderations of quantum tude of estimation of physic		and nuclear system	; make general			

	CLO 2 exp	lain h	ow light interacting with atom;	the working principle of las	ser trapping and	cooling			
	CLO 3 reco	ognize	the general features of atomic	c/nuclear spectroscopy					
	CLO 4 app	CLO 4 apply quantum physics to understand the basic features of simple nuclei, bi							
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in PHYS2265 Modern physics							
Offer in 2015 - 2016	N	Examination							
Offer in 2016 - 2017	N								
Course Grade	A+ to F								
Grade Descriptors		course though effectiv	strate thorough mastery at an advan- learning outcomes. Show strong ana t, and ability to apply knowledge to a e organizational and presentational si sults to draw appropriate and insightful	lytical and critical abilities and le wide range of complex, familia kills. Apply highly effective lab s	logical thinking, with ar and unfamiliar sit	evidence of original uations. Apply highly			
		course knowle	strate substantial command of a broad learning outcomes. Show evidence of dge to familiar and some unfamiliar se e lab skills and techniques. Correct us	of analytical and critical abilities situations. Apply effective organi	and logical thinking izational and prese	ງ, and ability to apply ntational skills. Apply			
		· · · · · · · · · · · · · · · · · · ·							
		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.							
		outcom knowle minima	strate little or no evidence of comm- nes. Lack of analytical and critical abil dge to solve problems. Organization lly effective or ineffective lab skills riate conclusions.	ities, logical and coherent thinking and presentational skills are in	ng. Show very little minimally effective	or no ability to apply or ineffective. Apply			
Course Type	Lecture-base	ed cou	ırse						
Course Teaching	Activities			Details		No. of Hours			
& Learning Activities	Lectures					36			
	Tutorials					18			
	Reading / S	elf stu	ıdy			80			
Assessment Methods and Weighting	Methods		Details	Weighting in fina course grade (%		sment Methods to CLO Mapping			
	Assignment	ts		20	0 CLC	1,2,3,4			
	Examination	n		50	0 CLC	1,2,3,4			
	Test			30	0 CLC	1,2,3,4			
Required/recommended reading and online materials	W. Demtrode K. Krane, Int	er, Ato roduc	rided by Course Coordinator oms, molecules and photons (S tory nuclear physics (John Wil id C. J. Joachain: Physics of A	ey & Sons, 1988)	rson, 2nd, 2003)			
		H. Bransden and C. J. Joachain: Physics of Atoms and Molecules (Pearson, 2nd, 2003)							

PHYS3150 Theoretical phys	Academic Year	2015							
Offering Department	Physics	Physics Quota							
Course Co-ordinator	Prof Z	Prof Z D Wang, Physics (zwang@hku.hk)							
Teachers Involved	Prof Z D	Wang, Physics							
Course Objectives		of this course is to provide students with the conceptual sk blems in all major areas of physics.	lls and key analytical	tools for solving					
Course Contents & Topics	Cauchy equation function	urse will introduce and address the following topics: Applicate in integral formula and calculus of residues, Partial differn, the Schrodinger equation, the Poisson equation, and the dissiduely used in Physics (Gamma functions, Beta functions, purier Series, and Fourier Transform.	rential equations (the fusion equation), Prop	general wave perties of special					
Course Learning Outcomes	On succ	essful completion of this course, students should be able to:							
	CLO 1	analyse and examine the analytical properties of complex fu	nctions						
	CLO 2	calculate various definite integrals using the method of resid	ues						
	CLO 3	CLO 3 analyse and solve the first and second order ordinary equations, and typical partial different equations							
	CLO 4	apply the special functions in handling various physical prob	ems						

	CLO 5 use the Fourier Series and Fourier transform in describing, respectively, any per and wave										
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in (PHYS2250 Introductory mechanics or PHYS2255 Introductory electricity and magnetism of PHYS2265 Modern physics) and (PHYS2150 Methods in physics I or MATH2211 Multivariable calculus)									
Offer in 2015 - 2016	Y 1st sem		Exa	mination	Dec						
Offer in 2016 - 2017	Υ										
Course Grade	A+ to F										
Grade Descriptors	cou	nonstrate thorough mastery at an advanc rse learning outcomes. Show strong anal ght, and ability to apply knowledge to a ctive organizational and presentational sk	ytical and critical abilities and log wide range of complex, familiar a	ical thinking, with e	evidence of original						
	cou	nonstrate substantial command of a broad rse learning outcomes. Show evidence of wledge to familiar and some unfamiliar sit	f analytical and critical abilities ar	nd logical thinking,	and 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.										
	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.										
	outo	nonstrate little or no evidence of comma comes. Lack of analytical and critical abili wledge to solve problems. Organization a	ties, logical and coherent thinking	j. Show very little o	r no ability to apply						
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	Weighting in final course grade (%)		ment Methods CLO Mapping						
	Assignments		20	CLO 1	,2,3,4,5						
	Examination	3-hour written exam	70	CLO 1	,2,3,4,5						
	Test		10	CLO 1	,2,3,4,5						
Required/recommended reading and online materials		rovided by Course Coordinator I. Weber: Mathematical Methods	for Physicists (Academic P	ress, 2005)							

PHYS3350 Classical mecha	credits)	Academic Year	2015							
Offering Department	Physics	Physics Quota								
Course Co-ordinator	Dr S Z Z	Or S Z Zhang, Physics (shizhong@hku.hk)								
Teachers Involved	Dr S Z Z	Zhang, Physics								
Course Objectives	undergr well as mechan who pla	uild on the foundation course PHYS2250, this course discusses classical mechanics in the advanced indergraduate level using Lagrangian formalism. It serves as a core course for physics major students as rell as an elective core for those who are interested in gaining a deep understanding of classical techanics and to apply related techniques in their own majors. This is also an essential course for those tho plan to pursue postgraduate studies in physics or related disciplines. Both conceptual ideas and tathematical treatment are emphasized.								
Course Contents & Topics	Lagrano relation mechan	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 non-inertial frame will also be discussed.								
Course Learning Outcomes	On succ	cessful completion of this course, students should be able to:								
	CLO 1	CLO 1 understand the logical structure of Lagrangian mechanics and its advantage over the Newtonian formulation;								
	CLO 2	write down the form of Lagrangian for a mechanical system simple cases	and solve the dynam	nic equations in						
	CLO 3 understand the general feature of a many-body system and the role of center of mass frame in two-body, as well as many-body and rigid body dynamics									
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	Pass in PHYS2250 Introductory mechanics								
Offer in 2015 - 2016	Y 1	st sem	Examination	Dec						

Offer in 2016 - 2017	Υ									
Course Grade	A+ to F	A+ to F								
Grade Descriptors	c tt	course lear hought, ar effective or	rning outcomes. Show strond ability to apply knowled	ng analytica ge to a wide onal skills.	evel of extensive knowledge and s I and critical abilities and logical the range of complex, familiar and u Apply highly effective lab skills and clusions.	hinking, with evidence of original nfamiliar situations. Apply highly				
	c	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.								
	le k n	The state of the s								
	o li p	outcomes. imited abi presentatio	Show evidence of some colity to apply knowledge	herent and I to solve p	rledge and skills required for attair ogical thinking, but with limited and roblems. Apply limited or bare kills and techniques. Limited ability	alytical and critical abilities. Show ly effective organizational and				
	o k n	outcomes. nowledge ninimally	Lack of analytical and criti to solve problems. Organ	al abilities, ization and	of knowledge and skills required folgical and coherent thinking. Sho presentational skills are minimal techniques. Misuse of data and	w very little or no ability to apply ly effective or ineffective. Apply				
Course Type	Lecture with I	aborato	ry component course							
Course Teaching	Activities				etails	No. of Hours				
& Learning Activities	Lectures	Lectures				36				
	Laboratory					6				
	Tutorials					8				
	Assessment					80				
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping				
	Assignments	3			20	CLO 1,2,3				
	Examination		2-hour written exam		60	CLO 1,2,3				
	Laboratory re	eports			10	CLO 3				
	Test	Test			10	CLO 1,2,3				
Required/recommended reading and online materials	David Morin:	Introduc	ed by Course Coordin tion to Classical Mecl d Jerry Marion: Clas	anics, (Ca	ambridge, 2007). amics of Particles and Sys	stems, (Cengage Learnin				
Course Website	L. 44 //	http://moodle.hku.hk								

PHYS3351 Quantum mech	anics (6	credits)	Academic Year	2015							
Offering Department	Physics	Physics Quota									
Course Co-ordinator	Dr W Ya	Dr W Yao, Physics (wangyao@hku.hk)									
Teachers Involved	Dr W Ya	Dr W Yao, Physics									
Course Objectives	undergr students mechan who pla	Build on the foundation course PHYS2265, this course discusses quantum mechanics in the advanced undergraduate level with vigorous mathematical treatment. It serves as a core course for physics majo students as well as an elective core for those who are interested to gain a deep understanding of quantum mechanics and to apply related techniques in their own majors. This is also an essential course for those who plan to pursue postgraduate studies in physics or related disciplines. Both conceptual ideas and mathematical treatment are emphasized.									
Course Contents & Topics	probabil Heisenb states; p ladder of Hilbert generali	ependent Schrodinger equation; statistical interpretation lity current and continuity equation; momentum; physical uncertainty principle; time-independent Schroding particle in a square well; transmission and reflection at a operators; free particle and wavepacket; delta function space; Hermitian operators; eigenstates and eigenvalized uncertainty principle; angular momentum; hydrogen ation theory.	sical observable and ex ger equation; Hamiltoniar barrier; harmonic oscillat potential; Dirac notation ues; generalized statistic	pectation value n and stationary or problem using s; state vectors al interpretation							
Course Learning Outcomes	On successful completion of this course, students should be able to:										
	CLO 1	CLO 1 describe the statistical interpretation of quantum mechanical systems, and calculate expectation values and uncertainty of physical observables									
	CLO 2 formulate energy eigenvalue problems, and solve them in examples where potentials has simple analytical forms										
	CLO 3 formulate time evolution of the wavefunction and the expectation value of physical observables with known energy eigenfunctions										

		CLO 4 judge the applicability of time-independent perturbation theory and formulate leading order energy corrections in certain perturbations applied to the physical system								
	CLO 5 ac	LO 5 acquire and interpret experimental data to examine the physical laws								
Pre-requisites (and Co-requisites and Impermissible combinations		ass in PHYS2265 Modern physics								
Offer in 2015 - 2016	Y 1st s	sem			Examina	tion De	ec			
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	A	course lea thought, a effective o	rning outcomes. Show stror nd ability to apply knowledg	g analytical and e to a wide rang onal skills. Apply	f extensive knowledge and sl critical abilities and logical th e of complex, familiar and ur highly effective lab skills and ns.	inking, with evidend Ifamiliar situations.	ce of original Apply highly			
	В	course lea	rning outcomes. Show evide to familiar and some unfar	ence of analytica niliar situations. A	knowledge and skills required I and critical abilities and logi Apply effective organizational If results to draw appropriate o	cal thinking, and ab and presentational	ility to apply			
	С									
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learn outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Shi limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational apresentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to diappropriate conclusions.								
	Fail	outcomes. knowledge minimally	Lack of analytical and critic to solve problems. Organ	al abilities, logica zation and pres	wledge and skills required for and coherent thinking. Show entational skills are minimall inques. Misuse of data and	v very little or no ab v effective or ineffe	oility to apply ective. Apply			
Course Type	Lecture wit	th laborato	ry component course							
Course Teaching	Activities	3		Details	 S	No.	of Hours			
& Learning Activities	Lectures				-		36			
	Laborator	У					6			
	Tutorials						8			
	Reading /	Self study					80			
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Assessment to CLO	Methods Mapping			
	Assignme	ents			10	CLO 1,2,	3,4			
	Examinati	ion	3-hour written exam		60	CLO 1,2,	3,4			
	Laborator	y reports			10	CLO 5				
	Test	•			20	CLO 1,2,	3,4			
	Lecture no	ntes provide	ed by Course Coordina	tor						
Required/recommended reading and online materials					on Prentice Hall, 2004,	2nd ed.)				

PHYS3450 Electromagneti	ism (6 cr	edits)					Academic Year	2015				
Offering Department	Physics	Physics Quota										
Course Co-ordinator	Prof X [Prof X D Cui, Physics (xdcui@hku.hk)										
Teachers Involved	Prof X	Prof X D Cui, Physics										
Course Objectives	undergr student electror those w	Build on the foundation course PHYS2255, this course discusses electromagnetism in the advanced undergraduate level with vigorous mathematical treatment. It serves as a core course for physics major students as well as an elective core for those who are interested to gain a deep understanding of electromagnetism and to apply related techniques in their own majors. This is also an essential course for those who plan to pursue postgraduate studies in physics or related disciplines. Both conceptual ideas and mathematical treatment are emphasized.										
Course Contents & Topics							atics, conductors naterials and Maxw					
Course Learning Outcomes	On succ	cessful cor	mpletion of this	course, stud	ents should b	oe able to:						
	CLO 1 identify the fundamental physics in electrostatics and magnetism											
	CLO 2	apply ma	athematical too	ls to describe	electrostatic	s and magne	tism					
	CLO 3	use the N	Maxwell's equa	tions to expla	in various ele	ectrostatic an	d magnetic phenon	nena				

	CLO 4	differentiate	between electrostatics in	n vacuum ai	nd in dielectric material	s				
	CLO 5	differentiate	between magnetism in v	acuum and	in magnetic materials					
		CLO 6 apply essential skills of making measurements with appropriate instresperiments; Interpret the experimental data and compare with the precephysical principle								
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in F	ass in PHYS2255 Introductory electricity and magnetism								
Offer in 2015 - 2016	Y 2r	nd sem			Examin	ation	May			
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	A	course lea thought, ar effective or	te thorough mastery at an ad ming outcomes. Show strong id ability to apply knowledge ganizational and presentation to draw appropriate and insig	analytical and to a wide rang al skills. Apply	critical abilities and logical to be of complex, familiar and to highly effective lab skills an	hinking, with ınfamiliar situ	evidence of original ations. Apply highly			
	В	course lea knowledge	te substantial command of a be ming outcomes. Show eviden to familiar and some unfamil to skills and techniques. Correct	ce of analytica ar situations.	I and critical abilities and log Apply effective organizations	gical thinking, Il and present	and ability to apply			
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability knowledge to most familiar situations. Apply moderately effective organizational and presentational skill moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results appropriate conclusions.								
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the courcutcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilimited ability to apply knowledge to solve problems. Apply limited or barely effective organiza presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and resu appropriate conclusions.					itical abilities. Show organizational and			
	Fail	outcomes. knowledge minimally	te little or no evidence of co Lack of analytical and critical to solve problems. Organiza effective or ineffective lab sl conclusions.	abilities, logica ition and pres	al and coherent thinking. Sho entational skills are minima	ow very little on the effective of	or no ability to apply or ineffective. Apply			
Course Type	Lecture v	with laborato	ry component course							
Course Teaching	Activitie	es		Detail	 S		No. of Hours			
& Learning Activities	Lectures						36			
	Laborat	ory					6			
	Tutorials	s					8			
	Reading	Reading / Self study								
Assessment Methods and Weighting	Method	ls	Details		Weighting in final course grade (%)		ment Methods CLO Mapping			
	Assignn	nents			10		CLO 1,2,3,4,5,6			
	Examina	ation	3-hour written exam		60	CLC	1,2,3,4,5			
	Laborat	ory reports			10	C	LO 1,6			
	Test				20	CLC	1,2,3,4,5			
Required/recommended reading and online materials			ed by Course Coordinate ction to Electrodynamics		Prentice-Hall, 1999).					
Course Website	http://mo	odle.hku.hk								

PHYS3550 Statistical mecl	Academic Year	2015						
Offering Department	Physics	Quota						
Course Co-ordinator	Prof M H Xie, Physics (mhxie @hku.hk)							
Teachers Involved	Prof M H Xie, Physics							
Course Objectives	thermodynamics in the advanced undergraduate level with vigorous m core course for physics major students as well as an elective core for deep understanding of statistical mechanics and thermodynamics and own majors. This is also an essential course for those who plan to pu	Build on the foundation course PHYS2260, this course discusses statistical mechanics and thermodynamics in the advanced undergraduate level with vigorous mathematical treatment. It serves as a core course for physics major students as well as an elective core for those who are interested to gain a deep understanding of statistical mechanics and thermodynamics and to apply related techniques in their own majors. This is also an essential course for those who plan to pursue postgraduate studies in physics or related disciplines. Both conceptual ideas and mathematical treatment are emphasized.						
Course Contents & Topics	Topics include: Elements of Ensemble Theory, Boltzmann, Fermi and Bose-Einstein statistics. Partition function and the laws of Thermodynamics. Disorder and entropy; concept of temperature; the free energy. Density of states. Classical gas, electrons in metals, and black body radiation. Heat capacities. Thermal properties of magnetic systems.							
Course Learning Outcomes	On successful completion of this course, students should be able to:							

ourse grade (%) 10 60 10 20 888). y and Statistical Ti	Assessment Meth to CLO Map CLO 1,2,3 CLO 1,2,3 CLO 1,4 CLO 1,2,3					
10 60 10	to CLO Map CLO 1,2,3 CLO 1,2,3 CLO 1,4					
10	to CLO Map CLO 1,2,3 CLO 1,2,3					
10	to CLO Map CLO 1,2,3					
• ` '	to CLO Map					
ourse grade (%)						
eighting in final						
	No. of H					
coherent thinking. Show	or attaining the course lead wery little or no ability to y effective or ineffective. results and/or unable to					
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						
C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the collearning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to a knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. A moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to a appropriate conclusions.						
critical abilities and logic	for attaining at least most cal thinking, and ability to and presentational skills. conclusions.					
I abilities and logical thi omplex, familiar and un	cills required for attaining a inking, with evidence of or ifamiliar situations. Apply techniques. Critical use o					
	,					
Examina	ition May					
ne physical laws						
atics						
athematical reason	ning, to situations of					
1	atics ne physical laws					

PHYS3551 Introductory so	Academic Year	2015							
Offering Department	Physics Quota								
Course Co-ordinator	Prof J Gao, Physics (jugao @hku.hk)								
Teachers Involved	Prof J Gao, Physics								
Course Objectives	To provides a broad introduction to modern theories of the behaviour and properties of the solid state of matter. It is designed as a self-contained course which at the same time will serve as a basis for more advanced courses and projects in solid state physics.								
Course Contents & Topics	Crystal structures and symmetry. The formation of crystals. The reci crystals. Lattice vibrations and thermal properties. Free-electron theo semiconductors, and insulators. If time permits, special topics sucmentioned.	ory of metals. Energy	bands; metals,						
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 demonstrate knowledge for crystal structures and characterization								

	CLO 2	describe the	the underlying physica	l concepts						
		apply physi materials	cal principles and mathe	matical e	quations to discuss th	ne physica	al properties o			
		apply esse experiments	ntial skills of making n	neasurem	ents with appropriate	instrume	nts in physics			
	CLO 5 i	interpret the	n the prediction of unde	rlying phys	sical principle					
Pre-requisites (and Co-requisites and mpermissible combinations)		ss in PHYS2260 Heat and waves and PHYS2265 Modern physics								
Offer in 2015 - 2016	Y 1st	t sem	ition	Dec						
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	A	course lea thought, a effective o	te thorough mastery at an advar rning outcomes. Show strong an nd ability to apply knowledge to rganizational and presentational s to draw appropriate and insightf	alytical and a wide rang skills. Apply	critical abilities and logical the of complex, familiar and unhighly effective lab skills and	inking, with nfamiliar situ	evidence of origina ations. Apply highly			
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least mo course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skill 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 clearning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results to appropriate conclusions.								
	D	Demonstrate partial but limited command of knowledge and skills required for attaining outcomes. Show evidence of some coherent and logical thinking, but with limited analyti limited ability to apply knowledge to solve problems. Apply limited or barely or presentational skills. Apply partially effective lab skills and techniques. Limited ability to appropriate conclusions.					itical abilities. Show organizational and			
	Fail	outcomes. knowledge minimally	te little or no evidence of comr Lack of analytical and critical ab to solve problems. Organizatic effective or ineffective lab skills e conclusions.	ilities, logica n and pres	I and coherent thinking. Shorentational skills are minimall	w very little o	r no ability to apply r ineffective. Apply			
Course Type	Lecture w	vith laborato	ry component course							
Course Teaching	Activitie	es		Details	 S		No. of Hours			
& Learning Activities	Lectures						36			
	Laborato	ory					(
	Tutorials	•					8			
	Reading	/ Self study					80			
Assessment Methods and Weighting	Methods	S	Details		Weighting in final course grade (%)		ment Methods CLO Mapping			
	Assignm	ents			15	CLO	O 1,2,3,5			
	Examina	ation	2-hour written exam		60	CL	.O 1,2,3			
	Laborato	ory reports			10	С	LO 4,5			
	Test				15	CL	.O 1,2,3			
Required/recommended reading and online materials	C. Kittel:	Introduction	to Solid State Physics (Jo	nn Wiley,	1986, 6th ed.)					

PHYS3650 Observational astronomy (6 credits)							cademic Year	2015	
Offering Department	Physics	Physics Quota							
Course Co-ordinator	Dr J J L	L Lim, Ph	ysics (jjlim@hk	ku.hk)					
Teachers Involved	Dr J J L	L Lim, Ph	ysics						
Course Objectives	wavelei wavelei	An introduction to tools of contemporary observation astronomy, with a focus on those used at optica wavelengths, as well as an introduction to observational aspects of stars and galaxies at optica wavelengths. An emphasis is placed on a hands-on approach for students to gain experience in doing astronomical observations and data reduction.							
Course Contents & Topics	on obse	Topics include: properties and configurations of optical telescopes; properties of light, atmospheric effects on observations; properties of astronomical detectors (PMT, CCD); astronomical imaging and magnitude system; astronomical spectroscopy; observations of stars and galaxies including blackbody radiation, color-magnitude system, emission and absorption spectrum, and astronomical redshifts.							
Course Learning Outcomes	On suc	On successful completion of this course, students should be able to:							
	CLO 1 describe and explain the workings of astronomical telescopes and modern detectors at optical wavelengths						n astronomical		

		escribe the oservations	e effects of the propertie	es of ligh	nt and Earth'	's atmos	sphere or	n astronomical
			the methods of astronor of stars, galaxies, and the		tometry and s	spectroso	copy are	applied to the
	CLO 4 or	perate a sm	nall optical telescope to con-	duct simpl	e day and nigh	nt sky ob	servations	•
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Ph physics)	HYS1650 N	ature of the universe and (PHYS225	0 Introductory	mechan	ics or PH	YS2265 Modern
Offer in 2015 - 2016	Y 1st s	sem			E	xaminat	ion	Dec
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attain course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. A effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critical unand results to draw appropriate and insightful conclusions.					vidence of original tions. Apply highly	
	В	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. If effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.						and ability to apply
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of the learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. moderately effective lab skills and techniques. Mostly correct but some erroneous use of data and results t appropriate conclusions.						and ability to apply tional skills. Apply
	D	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course lea outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. S limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to appropriate conclusions.						tical abilities. Show organizational and
	Fail Demonstrate little or no evidence of command of knowledge outcomes. Lack of analytical and critical abilities, logical and co knowledge to solve problems. Organization and presentations minimally effective or ineffective lab skills and techniques. It appropriate conclusions.				and coherent think tational skills are	king. Show minimally	very little or effective or	no ability to apply ineffective. Apply
Course Type	Lecture wit	th laborator	y component course					
Course Teaching	Activities			Details				No. of Hours
& Learning Activities	Lectures			Johann III				36
	Laborator	v						4
	Tutorials	,						8
	Reading /	Self study						80
Assessment Methods and Weighting	Methods		Details		Weighting in		Assessment Methods to CLO Mapping	
	Assignme	nts				30	CL	O 1,2,3
	Examinati		2-hour written exam			50		O 1,2,3
	Laborator	y reports				10	C	LO 4
	Test					10	CL	O 1,2,3
Required/recommended reading and online materials	Frederick F B. W. C	R. Chromey Carroll &	d by Course Coordinator r: To Measure the Sky D. A. Ostlie: An Int , 2007, 2nd edition)	roduction	to Modern	Astrop	hysics (Addison-Wesley

Teachers Involved Course Objectives Course Contents & Topics Topics include mechanics, t Course Learning Outcomes CLO 1 ca	g, Physics (ncy@bohr.physics.hku.hk) g, Physics e basic physical principles of astronomy and build a foundate: the sky and celestial coordinates, spherical geometry, two-body problem, radiative transfer, and blackbody radia	optics and telescope					
Teachers Involved Dr S C Y Ng Course Objectives To introduce Course Contents & Topics Topics include mechanics, to the Course Learning Outcomes Topics Topics include mechanics, to the Course Learning Outcomes Topics Include mechanics, to the Course Learning Outcomes Topics Include mechanics and the Course Learning Outcomes Topics Include Topics Incl	g, Physics basic physical principles of astronomy and build a foundate: the sky and celestial coordinates, spherical geometry,	optics and telescope					
Course Objectives Course Contents & Topics Topics included mechanics, to the Course Learning Outcomes CLO 1 care	e basic physical principles of astronomy and build a founda de: the sky and celestial coordinates, spherical geometry,	optics and telescope					
Course Contents & Topics Topics include mechanics, t Course Learning Outcomes CLO 1 ca	de: the sky and celestial coordinates, spherical geometry,	optics and telescope					
mechanics, t Course Learning Outcomes On successfi CLO 1 ca			es, basic celestia				
CLO 1 ca							
	On successful completion of this course, students should be able to:						
CI O 2	CLO 1 calculate the transformation between different celestial coordinate systems						
CLO 2 de	CLO 2 describe the formation of spectral lines and basic structures of telescopes						
CLO 3 de	CLO 3 derive the orbits in two body problem from first principle						
CLO 4 re	CLO 4 recall the radiative transfer equation						

Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Pl physics)	HYS165	O Nature of the universe and	(PHYS2250 Ir	ntroductory mech	anics or Pl	HYS2265 Modern	
Offer in 2015 - 2016	Y 1st	sem			Examin	ation	Dec	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	course	nstrate thorough mastery at an advan learning outcomes. Show strong ana t, and ability to apply knowledge to a re organizational and presentational sl	alytical and critical wide range of c	l abilities and logical	thinking, with	evidence of original	
	В	course	nstrate substantial command of a broat learning outcomes. Show evidence dedge to familiar and some unfamiliar si	of analytical and	critical abilities and lo	gical thinking	, and ability to apply	
	С							
	D							
	Fail Demonstrate little or no evidence of cor outcomes. Lack of analytical and critical a knowledge to solve problems. Organization			lities, logical and	coherent thinking. Sh	ow very little	or no ability to apply	
Course Type	Lecture-ba	ased co	urse					
Course Teaching	Activities			Details			No. of Hours	
& Learning Activities	Lectures						36	
	Tutorials						12	
	Reading /	Self stu	udy				80	
Assessment Methods and Weighting	Methods		Details		hting in final se grade (%)		sment Methods to CLO Mapping	
	Assignme	ents			12	CLC	1,2,3,4	
	Examinat	ion	2-hour written exam				1,2,3,4	
	Presentat	ion			13	Cl	_O 2,4	
	Test				15	CLC	1,2,3,4	
Required/recommended reading and online materials	Bradley W George B. Frank H. S A. C. Philli	Carrol Rybick Shu, The ps, The	vided by Course Coordinator I and Dale A. Ostlie, An Introdu i and Alan P. Lightman, Radiat e Physical Universe: An Introdu Physics of Stars (John Wiley al Physics, 2nd ed. (John Wile	ive Processes action to Astro & Sons, 1999)	s in Astrophysics nomy (University	(Wiley-Inte	rscience, 1985)	
Course Website	http://www	physic:	s.hku.hk/~phys3651/					

PHYS3652 Principles of as	tronomy	y (6 d	credits)			Academic Year	2015		
Offering Department	Physics	s				Quota			
Course Co-ordinator	Dr J J L	L Lim	, Physics (jjlim@	hku.hk)					
Teachers Involved	Dr J J L	L Lim	, Physics						
Course Objectives				nber of basic physical lge of the Universe.	al principles, and exp	plain how these prin	ciples are applied		
Course Contents & Topics	telescor	Topics include: special relativity, Doppler effect; interaction of light and matter, spectral lines; single telescopes and interferometers; binary stars and stellar parameters, exoplanets; classification of s spectra.							
Course Learning Outcomes	On succ	On successful completion of this course, students should be able to:							
	CLO 1	CLO 1 describe and explain the physical principles discussed							
	CLO 2 associate the correct physical principles with the observed properties of certain astronomical objects								
	CLO 3 apply their understanding of the physical principle discussed to explain or compute the observed properties of select astronomical objects								
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in physics		YS1650 Nature o	f the universe and (PHYS2250 Introduct	ory mechanics or Pl	HYS2265 Moder		
Offer in 2015 - 2016	Y 2	2nd s	em			Examination	May		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F	=							
Grade Descriptors	Α								

		Show	nstrate thorough mastery of the know strong analytical and critical abilities, edge to a wide range of complex, far ntation skills.	clear I	ogical thinking, evidence of or	iginal thought, and ability to apply		
	В	Demonstrate substantial command of the knowledge and skills required for attaining at least most of the collearning outcomes. Show evidence of analytical and critical abilities, reasoned logical thinking, and ability to a 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 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							
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for attaining the course lear outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to a knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.						
Course Type	Lecture-ba	ased co	urse					
Course Teaching	Activities			Det	ails	No. of Hours		
& Learning Activities	Lectures					36		
	Tutorials					12		
	Reading	/ Self st	udy			80		
Assessment Methods and Weighting	Methods	S	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents			35	CLO 1,2,3		
	Examina	tion	2-hour written exam		50	CLO 1,2,3		
	Test				15	CLO 2,3		
Required/recommended reading			vided by Course Coordinator & D. A. Ostlie: An In	troduc	ation to Modern Act	rophysics (Addison-Wesley		

PHYS3750 Laser and spec	troscopy	(6 credits)	Academic Year	2015				
Offering Department	Physics		Quota					
Course Co-ordinator	Prof S J	Xu, Physics (sjxu@hku.hk)						
Teachers Involved	Prof S J	Xu, Physics						
Course Objectives	The cou	rse aims at providing a broad introduction to major types	of lasers and modern las	er spectroscopy				
Course Contents & Topics	spectros	tion to lasers and modern laser spectroscopy. Fuscopic techniques. Lasers as spectroscopic light sents. Photoluminescence. Raman spectra.						
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1	restate the properties of fundamental optical processes						
	CLO 2	CLO 2 describe fundamental operation principle of modern lasers						
	CLO 3	CLO 3 demonstrate solid knowledge of modern laser spectroscopic techniques						
	CLO 4	identify main components of modern optical spectroscop	ic instruments					
	CLO 5	employ laser photoluminescence setup to measure low of solid samples	-temperature photolumin	escence spectra				
	CLO 6	interpret the experimental data and compare with the pre	ediction of underlying phy	sical principle				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	PHYS3551 Introductory solid state physics, or already en	rolled in this course.					
Offer in 2015 - 2016	Y 1:	st sem	Examination	Dec				
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attair course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. At effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critical u and results to draw appropriate and insightful conclusions.						
	В	Demonstrate substantial command of a broad range of knowledge course learning outcomes. Show evidence of analytical and critic knowledge to familiar and some unfamiliar situations. Apply effe effective lab skills and techniques. Correct use of data of results to	cal abilities and logical thinking ctive organizational and preser	, and ability to apply				
	С	effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.						

	outcon limited preser	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.						
	outcon knowle minima	Pail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learn outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to a knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. A minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to dappropriate conclusions.						
Course Type	Lecture with labor	ecture with laboratory component course						
Course Teaching	Activities		Detail	s	No. of Hours			
& Learning Activities	Lectures				36			
	Laboratory				10			
	Tutorials				8			
	Reading / Self st	udy			80			
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments			20	CLO 1,2,3,4,6			
	Examination	2-hour written exam		60	CLO 1,2,3,4			
	Laboratory repor	ts		20	CLO 5,6			
Required/recommended reading and online materials				duction to the Optical s	Spectroscopy of Inorganic			

PHYS3751 Physics of nanc	omateria	s (6 credits)	Academic Year	2015				
Offering Department	Physics		Quota					
Course Co-ordinator	TBC, PI	nysics ()						
Teachers Involved	TBC, PI	nysics						
Course Objectives	fundam	urse is designed to let senior undergraduate student ental concepts and physical properties of nanomaterials ensional quantum wires and zero-dimensional quantum	including two-dimensiona					
Course Contents & Topics	nanoma electron of quar	tion to nanomaterials and quantum size effect. Dimensiterials. Optical and transport properties of quantum gas. Physical properties of carbon nanotubes and semutum dots and nanocrystals. Fundamental principles and thin-film growth techniques such as molecular beamon.	wells, superlattices and niconductor nanowires. Ph of scanning tunneling	two-dimensiona ysical propertie microscopy and				
Course Learning Outcomes	On succ	essful completion of this course, students should be able	e to:					
	CLO 1 recall basic concepts and knowledge of dimensionality, density of states, quantum size effect							
	CLO 2	CLO 2 identify and compare optical and transport properties of quantum wells, superlattices are dimensional electron gas						
	CLO 3	recognise the fundamental principles of scanning tunn growth techniques such as molecular beam epitaxy and						
	CLO 4 describe the basic physics of carbon nanotubes and semiconductor nanowires							
	CLO 5	explain physical properties of zero-dimensional quantum	n dots and nanocrystals					
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in PHYS3351 Quantum mechanics, and Pass in PHYS3551 Introductory solid state physialready enrolled in this course.						
Offer in 2015 - 2016	N		Examination					
Offer in 2016 - 2017	N							
Course Grade	A+ to F							
Grade Descriptors	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 origin thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply high effective organizational and presentational skills.						
	B Demonstrate substantial command of the knowledge and skills required for attaining most of the course lear 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.							
	С	Demonstrate general but incomplete command of knowledge a learning outcomes. Show evidence of some analytical and critic knowledge to most familiar situations. Apply moderately effect moderately effective observation skills and techniques. Mostly or draw appropriate conclusions.	cal abilities and logical thinking, tive organizational and presenta	and ability to apply ational skills. Apply				
	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.							

		outcomes. Lack of ana	lytical and critical		required for attaining the course learning king. Show very little or no ability to apply nimally effective or ineffective.		
Course Type	Lecture-base	d 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						

							0045	
PHYS3850 Waves and option	-	its)				emic Year	2015	
Offering Department	Physics				Quot	a		
Course Co-ordinator		•	(sjxu@hku.hk)					
Teachers Involved		(u, Physics						
Course Objectives			ntroduction to the developm of light and optic application.		dern physical opti	ics, with parti	cular attention t	
Course Contents & Topics	the laws	of reflection	of wave motion and the eld and refraction; superpositications of polarization, inter	ion and Fo	ourier analysis of	waves; theor		
Course Learning Outcomes	On succe	ssful comple	etion of this course, students	s should b	e able to:			
			calculate the properties interference and diffraction				ction, refraction	
		apply the thoptical device	eory of optics to calculate es	the geom	netrical parameter	s of thick ler	ises and design	
	CLO 3 apply essential theories to design anti-reflection and reflection-enhancement films							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in P	HYS2255 Ir	ntroductory electricity and m	agnetism a	and PHYS2260 He	eat and wave	s	
Offer in 2015 - 2016	Y 2nd	d sem			Exam	nination	May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	В	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for at course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evider thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critici and results to draw appropriate and insightful conclusions. Demonstrate substantial command of the knowledge and skills required for attaining most of the contractions. Show a videous of population and critical politicing reasoned logical thinking and ability to apply the contraction.					evidence of origina lations. Apply highly . Critical use of data	
		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 is 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 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 on 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.						
	Fail	outcomes. knowledge minimally	te little or no evidence of comma Lack of analytical and critical abili to solve problems. Organization effective or ineffective lab skills	ities, logical a	and coherent thinking. tational skills are min	Show very little imally effective	or no ability to apply or ineffective. Apply	
Course Type		outcomes. knowledge minimally appropriate	te little or no evidence of comma Lack of analytical and critical abili to solve problems. Organization effective or ineffective lab skills	ities, logical a	and coherent thinking. tational skills are min	Show very little imally effective	or no ability to apply or ineffective. Apply	
Course Teaching		outcomes. knowledge minimally appropriate	te little or no evidence of comma Lack of analytical and critical abili to solve problems. Organization effective or ineffective lab skills e conclusions.	ities, logical a	and coherent thinking. tational skills are min	Show very little imally effective	or no ability to appl or ineffective. Appl d/or unable to drav	
Course Teaching	Lecture w	outcomes. knowledge minimally appropriate vith laborato	te little or no evidence of comma Lack of analytical and critical abili to solve problems. Organization effective or ineffective lab skills e conclusions.	ities, logical a and presen and techniq	and coherent thinking. tational skills are min	Show very little imally effective	or no ability to apply or ineffective. Apply for unable to draw	
Course Teaching	Lecture w	outcomes. knowledge minimally appropriate rith laborato	te little or no evidence of comma Lack of analytical and critical abili to solve problems. Organization effective or ineffective lab skills e conclusions.	ities, logical a and presen and techniq	and coherent thinking. tational skills are min	Show very little imally effective	or no ability to apply or ineffective. Apply //or unable to draw No. of Hours	
Course Teaching	Lecture w Activitie Lectures	outcomes. knowledge minimally appropriate ith laborato	te little or no evidence of comma Lack of analytical and critical abili to solve problems. Organization effective or ineffective lab skills e conclusions.	ities, logical a and presen and techniq	and coherent thinking. tational skills are min	Show very little imally effective	or no ability to apply or ineffective. Apply depth of unable to draw No. of Hours	
Course Teaching	Lecture w Activitie Lectures Laborato Tutorials	outcomes. knowledge minimally appropriate ith laborato	te little or no evidence of comma Lack of analytical and critical abili to solve problems. Organization effective or ineffective lab skills e conclusions. ry component course	ities, logical a and presen and techniq	and coherent thinking. tational skills are min	Show very little imally effective	or no ability to apply or ineffective. Apply //or unable to draw No. of Hours	
Course Teaching & Learning Activities Assessment Methods	Lecture w Activitie Lectures Laborato Tutorials	outcomes. knowledge minimally appropriate rith laborato s rry / Self study	te little or no evidence of comma Lack of analytical and critical abili to solve problems. Organization effective or ineffective lab skills e conclusions. ry component course	ities, logical a and presen and techniq	and coherent thinking. tational skills are min	Show very little imally effective and results and	or no ability to apply or ineffective. Apply	
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	Activitie Lectures Laborato Tutorials Reading	outcomes. knowledge minimally appropriate with laborato s rry / Self study	Ite little or no evidence of comma Lack of analytical and critical abili to solve problems. Organization effective or ineffective lab skills e conclusions.	ities, logical a and presen and techniq	and coherent thinking, tational skills are min ues. Misuse of data Weighting in fin course grade (9)	Show very little imally effective and results and al Asses (%)	or no ability to apply or ineffective. Apply for unable to draw No. of Hours 36 8	

	Laboratory reports	10	CLO 1
	Test	15	CLO 1,2,3
Required/recommended reading and online materials	Lecture notes provided by Course Coordinator Eugene Hecht: Optics, (Addison-Wesley, 2001, 4th ed.). R. Guenther: Modern Optics, (John Wiley, 1990).		
Course Website	http://moodle.hku.hk		

Titroccot Atomic and mac	ear physics (6 credits)			Adducti	ic Year	2015	
Offering Department	Physics				Quota		
Course Co-ordinator	Dr J H C	Lee, Physic	s (jleehc@hku.hk)				
Teachers Involved	Dr J H C	Lee, Physic	s				
Course Objectives	It aims to be put or	provide a c n practical a hysics. If tin	oherent and concise application of quan	e coverage of tum mechani	s of atomic physics and ru traditional atomic and nuc cs as well as conceptua interest will be also discu	clear physi I framewo	cs. Emphasis w rk of atomic ar
Course Contents & Topics	electroma	agnetic field	, spectroscopy; nuc	lear structure	hydrogen-like atom, mu, , shell model and nuclea be mentioned when appro	r reaction	
Course Learning Outcomes	On succe	ssful compl	etion of this course,	students show	uld be able to:		
			al considerations of agnitude of estimation		chanics to atomic and nuc	lear syste	m; make genera
	CLO 2	explain how	light interacting with	n atom			
	CLO 3 r	ecognize th	e general features	of multi-electro	on atomic system		
		apply quanti et al	um mechanics to ur	nderstand the	basic features of simple	nuclei, bin	ding of deutero
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in P	HYS3351 G	Quantum mechanics				
Offer in 2015 - 2016	Y 2nd	d sem			Examina	ation	May
Offer in 2016 - 2017	Υ	Y					
Course Grade	A+ to F						
Grade Descriptors	A	course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply effective organizational and presentational skills. Apply highly effective lab skills and techniques. Critical use 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					
		course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to app knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. App 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 cours learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to appl knowledge to most familiar situations. Apply moderately effective organizational and presentational skills. Appl 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 are presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to dra appropriate conclusions.						
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course lear outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to a knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective. A minimally effective or ineffective lab skills and techniques. Misuse of data and results and/or unable to appropriate conclusions.						or no ability to appl or ineffective. Appl
Course Type	Lecture w	ith laborato	ry component cours	е			
Course Teaching	Activitie	s		Det	ails		No. of Hour
& Learning Activities	Lectures						3
	Laborato	ry					
	Tutorials						
	Assessm	nent					8
Assessment Methods and Weighting	Methods	3	Details		Weighting in final course grade (%)		sment Method o CLO Mappin
	Assignm	ents			10	CL	O 1,2,3,4
	Evamina	tion			60	CI	O 1,2,3,4
	Examination Laboratory reports				00	OL	.0 1,2,3,4

	Test	20	CLO 1,2,3,4
Required/recommended reading and online materials	Lecture notes from the Course Coordina W. Demtroder: Atoms, molecules and pt K. Krane: Introductory nuclear physics (.	hotons (Springer, 2011, 2nd ed.)	

PHYS3999 Directed studies	in physic	s (6 crea	115)		Academic Year	2015			
Offering Department	Physics				Quota				
Course Co-ordinator	Prof J Wa	of J Wang, Physics (jianwang@hku.hk)							
Teachers Involved	Various te	achers in th	ne department, Physics						
Course Objectives	taken nor problem to academic available	mally in th by themsel staff using projects ra	e is offered to students major eir final year of study. It proves, either theoretical, ex the subject materials the sunge from small scale res rsity-level physics or astronomy.	provides students we perimental or nume tudent has learn in search, critical litera	with the opportunity erical, under the s all years of his/her	to study a sma upervision of a major study. Th			
Course Contents & Topics	the conter	nts and the	n taking this course should nature of their projects in ctive supervisor and the cou	the coming academ	ic year. They must				
	member. derivations students r	For theorets and the need to use	training in research literaturical project, students may critically analyze the resease computers to reproduce eve to understand the design	need to fill in math irch methods used existing numerical or	ematical gaps of so in the field. For nu simulation results.	me sophisticate imerical projects For experimenta			
Course Learning Outcomes	On succes	ssful comple	etion of this course, students	should be able to:					
			nowledge of a physics or a esearch journals based on w			erature review of			
	CLO 2 c	m							
	CLO 3 d	CLO 3 describe and explain connections between the physical principles and the study problem							
	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								
Pre-requisites (and Co-requisites and Impermissible combinations)	Physics M This capst	lajor, Mathe one course	edits of advanced level (3X) matics/Physics Major or Ast is for Astronomy, Mathema dent is allowed to take this	ronomy Major curric tics/Physics, and Ph	ulum. ysics Majors student				
Offer in 2015 - 2016	Y 1st	sem 2nd	sem Summer		Examination	No Exam			
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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 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. Show evidence of logical and independent thinking. Critical urelevant information from sources, showing ability to make meaningful comparisons between different secon interpretations and to quote/reference aptly. Correct use of data of results to draw appropriate conclusions. effective organizational and presentational skills.							
		effective or				different secondary			
	С	Demonstra Use of rele to quote/re		the subject. Show some wing ability to make comme erroneous use of dat	esults to draw appropriate evidence of logical and in parisons between differen	different secondary e conclusions. Apply andependent thinking nt interpretations and			
	C D	Demonstra Use of rele to quote/re Apply mode Demonstra evidence o summary	ganizational and presentational ski te general but incomplete grasp of vant information from sources, sho ference aptly. Mostly correct but so	the subject. Show some wing ability to make comme erroneous use of dat presentational skills. retention of some relevance Demonstrate use and refrison. Limited ability to	evidence of logical and in parisons between different a and results to draw appoint information, of the serence of several source use data and results	different secondary e conclusions. Apply andependent thinking at interpretations and ropriate conclusions abject. Show limited by but mainly through			
		Demonstra Use of relet to quote/re Apply mode Demonstra evidence o summary conclusions Demonstra evidence o Misuse of of	ganizational and presentational ski te general but incomplete grasp of vant information from sources, sho ference aptly. Mostly correct but sc erately effective organizational and te partial but limited grasp, with f logical and independent thinking rather than analysis and compa	the subject. Show some wing ability to make com me erroneous use of dat presentational skills. retention of some relevance Demonstrate use and refrison. Limited ability to organizational and presen of the knowledge and un Limited use of secondar	evidence of logical and i parisons between differer a and results to draw appart information, of the serence of several sources use data and results stational skills.	different secondary e conclusions. Apply independent thinking nt interpretations and ropriate conclusions ubject. Show limited s, but mainly through to draw appropriate ct. Show little or no comparison of them			
Course Type	D Fail	Demonstra Use of relet to quote/re Apply mode Demonstra evidence o summary conclusions Demonstra evidence o Misuse of of	ganizational and presentational ski te general but incomplete grasp of vant information from sources, sho ference aptly. Mostly correct but sc erately effective organizational and te partial but limited grasp, with f logical and independent thinking, rather than analysis and compa s. Apply limited or barely effective of the evidence of little or no grasp of f logical and independent thinking, data and results and/or unable to diffective or ineffective.	the subject. Show some wing ability to make com me erroneous use of dat presentational skills. retention of some relevance Demonstrate use and refrison. Limited ability to organizational and presen of the knowledge and un Limited use of secondar	evidence of logical and i parisons between differer a and results to draw appart information, of the serence of several sources use data and results stational skills.	different secondary, e conclusions. Apply andependent thinking it interpretations and ropriate conclusions abject. Show limited, but mainly through to draw appropriate ct. Show little or no comparison of them			
Course Teaching	D Fail	Demonstra Use of rele to quote/re Apply mode Demonstra evidence o summary conclusion: Demonstra evidence o Misuse of o minimally e	ganizational and presentational ski te general but incomplete grasp of vant information from sources, sho ference aptly. Mostly correct but sc erately effective organizational and te partial but limited grasp, with f logical and independent thinking, rather than analysis and compa s. Apply limited or barely effective of the evidence of little or no grasp of f logical and independent thinking, data and results and/or unable to diffective or ineffective.	the subject. Show some wing ability to make com me erroneous use of dat presentational skills. retention of some relevance Demonstrate use and refrison. Limited ability to organizational and presen of the knowledge and un Limited use of secondar	evidence of logical and i parisons between differer a and results to draw appart information, of the serence of several sources use data and results stational skills.	different secondary e conclusions. Apply independent thinking nt interpretations and ropriate conclusions ubject. Show limited s, but mainly through to draw appropriate ct. Show little or no comparison of them			
Course Teaching	D Fail Project-ba	Demonstra Use of rele to quote/re Apply mode Demonstra evidence o summary conclusion: Demonstra evidence o Misuse of o minimally e	ganizational and presentational ski te general but incomplete grasp of vant information from sources, she ference aptly. Mostly correct but so erately effective organizational and te partial but limited grasp, with f logical and independent thinking, rather than analysis and compa s. Apply limited or barely effective of te evidence of little or no grasp of f logical and independent thinking, lata and results and/or unable to diffective or ineffective.	the subject. Show some wing ability to make com me erroneous use of dat presentational skills. retention of some releve Demonstrate use and refision. Limited ability to organizational and presen timited use of secondar raw appropriate conclusions.	evidence of logical and i parisons between differer a and results to draw appart information, of the serence of several sources use data and results stational skills.	different secondary e conclusions. Apply independent thinking int interpretations and ropriate conclusions ubject. Show limited s, but mainly through to draw appropriate ct. Show little or no comparison of them esentational skills are			
Course Type Course Teaching & Learning Activities	D Fail Project-ba Activities Meeting v	Demonstra Use of rele to quote/re Apply mod Demonstra evidence o summary conclusions Demonstra evidence o Misuse of o minimally e	ganizational and presentational ski te general but incomplete grasp of vant information from sources, she ference aptly. Mostly correct but so erately effective organizational and te partial but limited grasp, with f logical and independent thinking, rather than analysis and compa s. Apply limited or barely effective of te evidence of little or no grasp of f logical and independent thinking, lata and results and/or unable to diffective or ineffective.	the subject. Show some wing ability to make com me erroneous use of dat presentational skills. retention of some releve Demonstrate use and refision. Limited ability to organizational and presen timited use of secondar raw appropriate conclusions.	evidence of logical and i parisons between differer a and results to draw appart information, of the serence of several sources use data and results stational skills.	different secondary a conclusions. Apply andependent thinking at interpretations and ropriate conclusions by the conclusions which is the conclusions of the comparison of them is sentational skills are			

			Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Oral presentation	including supervisor's comments (10%)	30	CLO 1,3,4,5
	Research report		70	CLO 1,2,3,4,5
Required/recommended reading and online materials	To be provided by in	dividual project supervisor		

PHYS4150 Computational	physics (6	credits)	Aca	ademic Year	2015				
Offering Department	Physics		Que	ota					
Course Co-ordinator	Prof J Wa	ang, Physics <i>(jianwang</i> @hku.hk)	'						
Teachers Involved	Prof J Wa	rof J Wang, Physics							
Course Objectives	physics p theoretica that cont significan	ne aim of the course is show how the power of computers enables to computational approach to so hysics problems to be adopted, which is distinct from, and complimentary to, traditional experimenta eoretical approaches. The material covered will be found useful in any project or problem solving at contains a strong computational or data analysis element. The course is designed such the gnificant fraction of the student's time is spent actually programming specific physical problems re an learning abstract techniques.							
Course Contents & Topics	integratio of classic equation, problems	he course will cover the following problems: Introductory computational physics and computer al tegration and differentiation, interpolation and extrapolation, ordinary differential equation such as classical mechanics, partial differential equations (such as the Maxwell's equation, the diquation, and the Schrodinger equation), matrix methods (such as systems of equations and eigeroblems applied to Poisson's equation and electronic structure calculations), Monte Carlo (Metgorithm) and other simulation methods (such as molecular dynamics), and several physics projects.							
Course Learning Outcomes	On succe	ssful completion of this course, stude	nts should be able to:						
		CLO 1 demonstrate knowledge in essential methods and techniques for numerical computation physics							
		CLO 2 apply Monte Carlo method and other simulation methods to solve deterministic as we probabilistic physical problems							
	CLO 3 employ appropriate numerical method to interpolate and extrapolate data collected from pleasurements								
	CLO 4 use appropriate numerical method to solve the differential equations governing the dynamics physical systems								
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in (PHYS3150 Theoretical physics or MATH3301 Algebra I or MATH3401 Analysis I or MA Functions of a complex variable or MATH3405 Differential equations); and Pass in any three following courses: PHYS3350 Classical mechanics, PHYS3351 Quantum mechanics, PH Electromagnetism, PHYS3550 Statistical mechanics and thermodynamics								
Offer in 2015 - 2016	Y 1st	sem	Exa	mination	Dec				
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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. 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 course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to a knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. A effective lab skills and techniques. Correct use of data of results to draw appropriate conclusions.								
	С	learning outcomes. Show evidence of son knowledge to most familiar situations. Ap	mmand of knowledge and skills required for attaining most of the cour ome analytical and critical abilities and logical thinking, and ability to app Apply moderately effective organizational and presentational skills. Appliques. Mostly correct but some erroneous use of data and results to dra						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and cr limited ability to apply knowledge to solve problems. Apply limited or barely effective presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data								
		presentational skills. Apply partially effective appropriate conclusions.	e lab skills and techniques. Limited	ability to add data	and results to draw				
	Fail		mand of knowledge and skills requilities, logical and coherent thinking on and presentational skills are m	uired for attaining to Show very little continually effective of	the course learning or no ability to apply or ineffective. Apply				
Course Type		appropriate conclusions. Demonstrate little or no evidence of com outcomes. Lack of analytical and critical al knowledge to solve problems. Organization minimally effective or ineffective lab skill.	mand of knowledge and skills requilities, logical and coherent thinking on and presentational skills are m	uired for attaining to Show very little continually effective of	the course learning or no ability to apply or ineffective. Apply				
Course Teaching		appropriate conclusions. Demonstrate little or no evidence of com outcomes. Lack of analytical and critical al knowledge to solve problems. Organizati minimally effective or ineffective lab skill appropriate conclusions.	mand of knowledge and skills requilities, logical and coherent thinking on and presentational skills are m	uired for attaining to Show very little continually effective of	the course learning or no ability to apply or ineffective. Apply for unable to draw				
Course Teaching	Lecture w	appropriate conclusions. Demonstrate little or no evidence of com outcomes. Lack of analytical and critical al knowledge to solve problems. Organizati minimally effective or ineffective lab skill appropriate conclusions.	mand of knowledge and skills requilities, logical and coherent thinking on and presentational skills are ms and techniques. Misuse of data	uired for attaining to Show very little continually effective of	the course learning or no ability to apply or ineffective. Apply for unable to draw				
Course Type Course Teaching & Learning Activities	Lecture w	appropriate conclusions. Demonstrate little or no evidence of com outcomes. Lack of analytical and critical al knowledge to solve problems. Organization minimally effective or ineffective lab skill appropriate conclusions. with laboratory component course	mand of knowledge and skills requilities, logical and coherent thinking on and presentational skills are ms and techniques. Misuse of data	uired for attaining to Show very little continually effective of	the course learning or no ability to apply or ineffective. Apply				

	Reading / Self study					
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	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. Wo		Physics and Engineering (World physics (Pearson Education Inc			

PHYS4151 Data analysis ar	ia modei	ing in physics (o credits)		Academic Year	2015				
Offering Department	Physics			Quota					
Course Co-ordinator	Prof H F	Chau, Physics (hfchau@hku.hk)							
Teachers Involved	Prof H F	Chau, Physics							
Course Objectives	with spe focus is provides	rse covers general modeling and dat cial emphasis on their uses in compl on the basic principles and concept a solid foundation for students who i . It also prepares students to work in the	ex systems, nonlinear s s rather than the use on tended to do computat	ystems and adaptive of computer package	systems. The systems our				
Course Contents & Topics	the fit, ba and/or p complex as Matla a particu and the	nclude basic data analysis techniques asic hypothesis testing techniques, mo artial), difference equations as well as systems, complex adaptive systems to in modeling and data analysis. The lar software package or physical mostudents, illustrative examples will be agnetism and quantum mechanics as sics.	deling physical and rela s discrete models such and nonlinear dynamics emphasis is on the basion del. Depending on the drawn from conventiona	ted systems via differ as cellular automata, the use of compute principles and concernitudal interests of the lifields such as class	rential (ordina introduction r package suce the pts rather that the coordinato ical mechanic				
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 describe and explain state-of-the-art modeling methods used in physics								
		CLO 2 apply basic modeling techniques, together with logical and mathematical reasoning, to situations of the physical world							
	CLO 3 analyse and solve problems with the aid of computer packages such as Matlab								
	CLO 4	from physics experiments							
Pre-requisites (and Co-requisites and Impermissible combinations)	Function courses:	(PHYS3150 Theoretical physics or M. s of a complex variable or MATH3405 PHYS3350 Classical mechanics, PHY 50 Statistical mechanics & thermodyna	Differential equations); /S3351 Quantum mecha	and Pass in any one	of the following				
Offer in 2015 - 2016	N			Examination					
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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 computer modeling skills and techniques. Critical use of data and results to draw appropriate and insightful conclusions.								
	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. Apply effective computer modeling 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 computer modeling 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 computer modeling 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 computer modeling skills and techniques. Misuse of data and results and/or unable to draw appropriate conclusions.								
Course Type	Lecture v	with laboratory component course							
Course Teaching	Activitie	es	Details		No. of Hours				
& Learning Activities									

	Laboratory			12
	Tutorials			8
	Reading / Self s	tudy		80
Assessment Methods and Weighting	Methods	Methods Details		Assessment Methods to CLO Mapping
	Assignments		10	CLO 1,2,3,4
	Examination	2-hour written exam	50	CLO 1,2,4
	Presentation		20	CLO 1,4
	Project report		20	CLO 1,2,3,4
Required/recommended reading and online materials	J. R. Taylor: An I B. Hahn and D. \ L. Lam: Nonlinea N. Boccara: Mod	/alentine: Essential Matlab for ir Physics for Beginners (World eling Complex Systems (Sprin		,

PHYS4350 Advanced class	icai mecr	ianics (o creaits)			Academic Y	ear	2015	
Offering Department	Physics					Quota			
Course Co-ordinator	Prof S Q	f S Q Shen, Physics (sshen@hku.hk)							
Teachers Involved	Prof S Q	Shen, Ph	ysics						
Course Objectives	mathema	Id on the advanced undergraduate level course PHYS3350, this course further discusses concepts and thematical techniques in classical mechanics through special topics and applications. It serves as an ctive course to better prepare students for their postgraduate studies in physics or other related ciplines.							
Course Contents & Topics			amiltonian principles, L iational principle, gener						
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1	CLO 1 explain the difference between Newtonian mechanics and analytical mechanics							
	CLO 2	CLO 2 solve the mechanical problems using Lagrangian formalism							
		CLO 3 discuss the connection between classical mechanics and quantum mechanics from Hamiltonian formalism							
	CLO 4	apply the	variational principle to i	eal physic	al situations				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in F	PHYS335	O Classical mechanics						
Offer in 2015 - 2016	Y 2n	d sem				Examinatio	า	May	
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	Demonstrate thorough 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 thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Appleffective organizational and presentational skills.					evidence of origina		
	B Demonstrate substantial command of the knowledge and skills required for attaining at least most learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and at knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational s					nd ability to appl			
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and abilities knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					and ability to appl			
	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 cou	ırse						
Course Teaching	Activitie	es		D)etails			No. of Hours	
& Learning Activities	Lectures	3						36	
	Tutorials						1:		
	Reading	/ Self stu	ıdy					80	
Assessment Methods and Weighting	Method	s	Details		Weighting in course grade			ment Methods CLO Mapping	
	Assignm	ents				20	CIO	1,2,3,4	

	Examination	3-hour written exam	60	CLO 1,2,3,4						
	Test		20	CLO 1,2,3,4						
Required/recommended reading and online materials		rovided by Course Coordinator Poole, and J. Safko, Classical Mechar	nics, (Pearson Education	Inc, 2004)						
Course Website	http://moodle.hk	xu.hk		http://moodle.hku.hk						

PHYS4351 Advanced quan	tum mech	nanics (6 credits)		Academic Year	2015								
Offering Department	Physics				Quota									
Course Co-ordinator	Dr W Yac	, Physic	s (wangyao@hku.hk)											
Teachers Involved	Dr W Yac	, Physic	S											
Course Objectives	mathema	d on the advanced undergraduate level course PHYS3351, this course further discusses concepts and nematical techniques in quantum mechanics through special topics and applications. It serves as ar tive course to better prepare students for their postgraduate studies in physics or other related iplines												
Course Contents & Topics	non-dege	nerate a	Pauli exclusion principle. Fern and degenerate perturbation t tial waves and Born approximat	heory. Time depende	nt perturbation the									
Course Learning Outcomes	On succe	ssful cor	npletion of this course, students	s should be able to:										
		CLO 1 review the perturbation theory and some other approximation methods on various quantum systems												
	CLO 2	CLO 2 apply physics principles to describe the physical properties of various quantum systems												
			rate knowledge and discuss quantum systems	the underlying physic	cal concepts ass	ociated with the								
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in P	HYS335	1 Quantum mechanics											
Offer in 2015 - 2016	Y 2nd	d sem		Examination	May									
Offer in 2016 - 2017	Υ					'								
Course Grade	A+ to F													
Grade Descriptors	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	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	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													
	Fail													
Course Type	Lecture-b	ased co	urse											
Course Teaching	Activitie	s		Details		No. of Hours								
& Learning Activities	Lectures					36								
	Tutorials					12								
	Reading	/ Self sti	udy			80								
Assessment Methods and Weighting	Methods	S	Details	Weighting in fi		ssment Methods to CLO Mapping								
	Assignm	ents			20 CL	O 1,2,3								
	Examina	ition	3-hour written exam		60 CL	O 1,2,3								
	Test				20 CL	O 1,2,3								
Required/recommended reading and online materials			vided by Course Coordinator oduction to Quantum Mechanica	s (Pearson Prentice Ha	all, 2004, 2nd editi	on).								
Course Website	http://www	u physic	s.hku.hk/~phys4351/											

Р	HYS4450 Advanced electromagnetism (6 credits)	Academic Year	2015	

Offering Department	Physics				Quota				
Course Co-ordinator	Prof X D C	of X D Cui, Physics (xdcui@hku.hk)							
Teachers Involved	Prof X D C	rof X D Cui, Physics							
Course Objectives	mathemat	uild on the advanced undergraduate level course PHYS3450, this course further discusses concepts and athematical techniques in electromagnetism through special topics and applications. It serves as an active course to better prepare students for their postgraduate studies in physics or other related sciplines.							
Course Contents & Topics		pics include Maxwell's Equations, Poynting theorem, wave equations, reflection and transmission of aves, wave guides, retarded potentials, gauge transformations, dipole radiation, special theory of ativity.							
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 review and discuss the fundamental physics in classical electrodynamics								
	CLO 2	pply Ma	axwell's equations to analyze o	compli	cated electrostatic and m	agnetic phe	nomena		
	CLO 3 evaluate how special relativity is incorporated in the study of electromagnetism								
	CLO 4 fo	ormulat	e and solve problems in electro	omagr	etism using appropriate	mathematic	al techniques		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Ph	HYS345	50 Electromagnetism						
Offer in 2015 - 2016	Y 1st	sem			Exami	nation	Dec		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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 co	urse						
Course Teaching	Activities	S		Det	ails		No. of Hours		
& Learning Activities	Lectures						36		
	Tutorials						12		
	Reading	/ Self st	udv				80		
Assessment Methods			<u> </u>						
and Weighting	Methods		Details		Weighting in final course grade (%)		sment Methods o CLO Mapping		
	Assignme	ents			10	CLO	1,2,3,4		
	Examinat	ion	3-hour written exam		60	CLO	1,2,3,4		
	Test				30	CLO			

PHYS4550 Advanced stati	Academic Year	2015						
Offering Department	Physics	Quota						
Course Co-ordinator	Dr Y Tu, Physics (yanjuntu@hku.hk)							
Teachers Involved	Dr Y Tu, Physics	Dr Y Tu, Physics						
Course Objectives	mathematical techniques in statistical mechanics through special to	Build on the advanced undergraduate level course PHYS3550, this course further discusses concepts and mathematical techniques in statistical 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						
Course Contents & Topics	Topics include: Statistical ensembles for isolated and open systems. Equilibrium fluctuations. Order and disorder phase transition. Mean field and Landau theory. Classical ideal gas, quantum ideal gas. Quantum fluid.							
Course Learning Outcomes								

	On succ	essful co	mpletion of this course, studen	ts should be able to:				
	CLO 1	describe	and explain the fundamental p	hysical principles				
	CLO 2 apply these principles, together with logical and mathematical reasoning, to situations of the physical world							
	CLO 3	CLO 3 analyses and solve problems with the aids of mathematics						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	Pass in PHYS3550 Statistical mechanics & thermodynamics						
Offer in 2015 - 2016	Y 2r	nd sem			Examination	May		
Offer in 2016 - 2017	Υ					'		
Course Grade	A+ to F							
Grade Descriptors	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							
	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	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 co	urse					
Course Teaching	Activiti	es		Details		No. of Hours		
& Learning Activities	Lecture	s				36		
	Tutorial	s				12		
	Reading	g / Self st		80				
Assessment Methods and Weighting	Method	ls	Details	Weighting in course grade		essment Methods to CLO Mapping		
	Assignr	nents			20 (CLO 1,2,3		
	Examin	ation	3-hour written exam		60 (CLO 1,2,3		
	Test				20 (CLO 1,2,3		
Required/recommended reading and online materials	F. Mand C. Kittel:	l: Statistic Element ars & G.	vided by Course Coordinator cal Physics, 2nd edition (John V ary Statistical Physics (Robert L. Salinger: Thermodynamics,	E. Krieger, 1988)	Statistical Thermo	dynamics (Addison-		

PHYS4650 Stellar physics	Academic Year	2015								
Offering Department	Physics		Quota							
Course Co-ordinator	Dr S C Y Ng, Physics (ncy@bohr.physics.hku.hk)									
Teachers Involved	Dr S C	Dr S C Y Ng, Physics								
Course Objectives	treatme	To introduce the basic theory of stellar structure and evolution. It follows a vigorous mathematical treatment that stresses on the underlying physical processes. Knowledge in quantum mechanics and statistical mechanics will be advantageous.								
Course Contents & Topics	model. of stars evolutio mention	Topics include: Definition of stars. The H-R diagram. Stellar structure equations. Polytro model. Elementary stellar radiation processes. Simple stellar nuclear processes. Saha equation. Stabil of stars. Zero-age main sequence stars and their evolution. The solar neutrino problem. Late state evolution of stars. Supernova explosion. If time permits, special topics selected from below will be bried mentioned: star formation, brown dwarfs and planets, AGB stars and planetary nebulae, binary stars at their evolution, Cepheid variables and theory of stellar pulsation, and introduction to helioseismology.								
Course Learning Outcomes	On successful completion of this course, students should be able to:									
	CLO 1 describe what is stars and to classify different types of stars									
	CLO 2 analytically calculate and solve problems related to the structure and evolution of stars including the use of stellar structure equations and Saha equations									
	CLO 3 critically examine the physical processes occurring in stars and how these processes affect the evolution of stars									
	CLO 4	assess selected research papers in the field of stellar astroph	nysics	CLO 4 assess selected research papers in the field of stellar astrophysics						

Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in P	HYS3651	1 The physical universe and Ph	HYS3351 Quantum med	chanics		
Offer in 2015 - 2016	Y 2nd	d sem			Examina	ation	May
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	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.					
	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.					
	С	learning	strate general but incomplete comma g outcomes. Show evidence of some dge to most familiar situations. Apply n	analytical and critical abilitie	es and logi	cal thinking, a	nd ability to apply
	D	outcom	strate partial but limited command of I es. Show evidence of some coherent a ability to apply knowledge to solvational skills.	and logical thinking, but with	limited ana	lytical and criti	cal abilities. Show
	Fail	outcom	strate little or no evidence of comma es. Lack of analytical and critical abilit dge to solve problems. Organization ar	ies, logical and coherent thir	nking. Show	w very little or	no ability to apply
Course Type	Lecture-b	ased cou	rse				
Course Teaching	Activitie	Activities		Details			No. of Hours
& Learning Activities	Lectures						36
	Tutorials	Tutorials					12
	Reading	Reading / Self study				80	
Assessment Methods and Weighting	Methods	5	Details	Weighting in to			nent Methods CLO Mapping
	Assignm	ents			10	CLO ²	1,2,3,4
	Examina	ition	2-hour written exam		60	CLO	1,2,3
	Project r	eports			10	CLO ²	1,2,3,4
	Test				20	CLO	1,2,3
Required/recommended reading and online materials	Prialnik, [A. C. Phil Bowers, F	Lecture notes provided by Course Coordinator Prialnik, D.: An introduction to the theory of stellar structure and evolution, 2nd ed. (CUP, 2010) A. C. Phillips, The Physics of Stars (John Wiley & Sons, 1999) Bowers, R. & Deeming, T.: Astrophysics I. Stars (Jones and Bartlett, 1984) Francis, LeBlanc, An Introduction to Stellar Astrophysics (Wiley, 2010)					
Course Website	http://www	w.physics	.hku.hk/~phys4650/				

PHYS4651 Selected topics	Academic Year	2015						
Offering Department	Physics		Quota					
Course Co-ordinator	Prof K S	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 as a self-contained course or a background to research work in astrophysics.						
Course Contents & Topics	relativity.	Topics include: Brief review of thermodynamical equilibrium, radiation mechanisms and general relativity. Physics of shock wave. Properties of Cosmic rays. Physics of compact stellar objects including black holes, white dwarfs, neutron stars and quark stars. Elements of cosmology: classical and relativistic dynamical theories, observational parameters.						
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 astrophysical systems							
	CLO 2 explain the observed phenomena of some selected astrophysical objects							
	CLO 3 demonstrate knowledge and discuss the underlying physical concepts associated with the astrophysical systems and their dynamic interactive processes							
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in PHYS3351 Quantum mechanics or PHYS3450 Electromagnetism or PHYS3550 Statistic mechanics & thermodynamics or PHYS3651 The physical universe						
Offer in 2015 - 2016	Y 1st	sem	Examination	Dec				
Offer in 2016 - 2017	N			'				
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attacourse learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence							

	thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highleffective 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.						
	lea	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.					
	out	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.					
	out	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						
	Tutorials			8			
	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	2-hour written exam	50	CLO 1,2,3			
	Presentation		15	CLO 1,2,3			
	Test		25	CLO 1,2,3			
Required/recommended reading and online materials	S. L. Shapiro a B. W. Carro	orovided by Course Coordinator nd S. A. Teukolsky: Black Holes, oll & D. A. Ostlie: An Int mpany, 2007, 2nd edition)					

PHYS4652 Planetary scien	ce (o cie	uitə)	Academic Year	2015			
Offering Department	Physics		Quota				
Course Co-ordinator	Dr M H I	Lee, Physics (mhlee@hku.hk)					
Teachers Involved	Dr M H I	Lee, Physics					
Course Objectives	System	This course provides students with a modern advanced-level understanding of the properties o System and planetary systems around other stars and of the physical, chemical, and geological that govern them.					
Course Contents & Topics		Terrestrial planets, giant planets, moons and minor bodies in our Solar System; planetary denergy transport; planetary atmospheres, surfaces, and interiors; planet formation; extrasolar planet					
Course Learning Outcomes	On succ	essful completion of this course, students should be able to:					
	CLO 1	describe key aspects of our Solar System and extrasolar observations and experiments	planetary systems	acquired throug			
	CLO 2	explain essential elements of the processes governing the p	properties of planetary	/ bodies			
	CLO 3 apply physical principles to construct models for some basic aspects of the structure, formation and evolution of planetary bodies						
		and evolution of planetary bodies					
(and Co-requisites and		PHYS3651 The physical universe or (PHYS3350 Classical cs & thermodynamics)	mechanics and PH	/S3550 Statistic			
(and Co-requisites and Impermissible combinations)	mechan	PHYS3651 The physical universe or (PHYS3350 Classical	mechanics and PHY	/S3550 Statistic			
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016	mechan	PHYS3651 The physical universe or (PHYS3350 Classical cs & thermodynamics)					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017	mechan Y 2	PHYS3651 The physical universe or (PHYS3350 Classical cs & thermodynamics)					
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	mechan Y 2	PHYS3651 The physical universe or (PHYS3350 Classical cs & thermodynamics)	Examination owledge and skills require s and logical thinking, with	May d for attaining all the evidence of origin			
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Mechan Y 21 N A+ to F	PHYS3651 The physical universe or (PHYS3350 Classical cs & thermodynamics) Indicate the second of t	Examination owledge and skills require is and logical thinking, with familiar and unfamiliar sit in the skills required for attaining the sand logical thinking the sand logi	May d for attaining all the evidence of origin uations. Apply high g at least most of the g, and ability to app			
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Mechan Y 21 N A+ to F	PHYS3651 The physical universe or (PHYS3350 Classical cs & thermodynamics) Indicate the sem and sem between the seminary of t	Examination owledge and skills require s and logical thinking, with familiar and unfamiliar sit d skills required for attaining bilities and logical thinking organizational and presentaskills required for attaining bilities and logical thinking	May d for attaining all the evidence of origin uations. Apply high g at least most of the additional skills. I most of the cours, and ability to app			
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	N A+ to F	PHYS3651 The physical universe or (PHYS3350 Classical cs & thermodynamics) Indicate the seminary and the se	Examination Towledge and skills require is and logical thinking, with familiar and unfamiliar sit in diskills required for attaining bilities and logical thinking organizational and presentations and presentation inizational and presentation quired for attaining some of the property o	May d for attaining all the evidence of origin uations. Apply high g at least most of the g, and ability to appational skills. most of the cours, and ability to appare to the cours of the course learning of the course learning or the course learning of the course lea			

	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. Lecture-based course						
Course Type							
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			
	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	Lecture notes provided by Course Coordinator I. de Pater and J. J. Lissauer: Planetary Sciences (Cambridge Univ. Press, 2010, 2nd Ed.) D. A. Rothery, N. McBride and I. Gilmour: An Introduction to the Solar System (Cambridge University Press, 2011, 2nd Ed.)						
Course Website	http://moodle.hk	u.hk					

PHYS4653 Cosmology (6 c	redits)		Academic \	/ear 2015				
Offering Department	Physics		Quota					
Course Co-ordinator	Prof K S	Cheng, Physics (hrspksc@hku.hk)						
Teachers Involved	Prof K S	Prof K S Cheng, Physics						
Course Objectives	mathema	The aim of the course is to offer an advanced introduction to cosmology, to familiarize students with mathematical formulation used to model the evolution and dynamics of the universe, and to provide a to date discussion of the big bang theory and structure and galaxy formation.						
Course Contents & Topics	The big I	Topics include: The visible universe. Empirical basis for cosmological theories. The metric of the unive The big bang models. Thermodynamics of the early universe. Primordial nucleosynthesis. The very e universe. Inflationary models. The cosmological constant problem. Structure and galaxy formation.						
Course Learning Outcomes	On succe	essful completion of this course, student	s should be able to:					
	CLO 1	apply physics principles to describe the	observational/experimental aspects	of cosmology				
	CLO 2	explain the observed phenomena of cos	smology					
		demonstrate knowledge and discuss cosmological evolution of the universe a in the universe	, , , , ,					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in F	PHYS3651 The physical universe or PH	YS3652 Principles of astronomy					
Offer in 2015 - 2016	N	N Examinat						
Offer in 2016 - 2017	Υ							
	Y A+ to F			<u>'</u>				
Offer in 2016 - 2017 Course Grade Grade Descriptors		Demonstrate thorough mastery at an advancourse learning outcomes. Show strong ana thought, and ability to apply knowledge to a effective organizational and presentational sh	lytical and critical abilities and logical thinking wide range of complex, familiar and unfam	ng, with evidence of origina				
Course Grade	A+ to F	course learning outcomes. Show strong and thought, and ability to apply knowledge to a	lytical and critical abilities and logical thinking wide range of complex, familiar and unfarrills. d range of knowledge and skills required for a family and logical and logical and logical.	ng, with evidence of origina illiar situations. Apply highly attaining at least most of the thinking, and ability to apply				
Course Grade	A+ to F	course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational shows the properties of a broad course learning outcomes. Show evidence of the properties of the	lytical and critical abilities and logical thinking wide range of complex, familiar and unfamills. If an ange of knowledge and skills required for its family and logical and critical abilities and logical auditons. Apply effective organizational and pand of knowledge and skills required for a analytical and critical abilities and logical to the second seco	ng, with evidence of origina illiar situations. Apply highly attaining at least most of the thinking, and ability to apply resentational skills. ttaining most of the course hinking, and ability to apply				
Course Grade	A+ to F A B	course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational skips of the course learning outcomes. Show evidence of knowledge to familiar and some unfamiliar sit of Demonstrate general but incomplete comm learning outcomes. Show evidence of some	lytical and critical abilities and logical thinking wide range of complex, familiar and unfamilist. If range of knowledge and skills required for an analytical and critical abilities and logical unations. Apply effective organizational and pand of knowledge and skills required for an analytical and critical abilities and logical throderately effective organizational and pressence and skills required for attaining and logical thinking, but with limited analytic	ng, with evidence of origina illiar situations. Apply highly attaining at least most of the thinking, and ability to apply resentational skills. ttaining most of the course hinking, and ability to apply entational skills. some of the course learning at and critical abilities. Show				
Course Grade	A+ to F A B C	course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational shows the course learning outcomes. Show evidence of knowledge to familiar and some unfamiliar sit. Demonstrate general but incomplete comm learning outcomes. Show evidence of some knowledge to most familiar situations. Apply to Demonstrate partial but limited command of outcomes. Show evidence of some coherent limited ability to apply knowledge to so	lytical and critical abilities and logical thinking wide range of complex, familiar and unfamilist. If ange of knowledge and skills required for an analytical and critical abilities and logical unations. Apply effective organizational and pand of knowledge and skills required for a analytical and critical abilities and logical thoderately effective organizational and presunderately effective organizational ending and logical thinking, but with limited analytic ve problems. Apply limited or barely earned of knowledge and skills required for a titles, logical and coherent thinking. Show we	ng, with evidence of origina illiar situations. Apply highly attaining at least most of the thinking, and ability to apply resentational skills. Itaining most of the course hinking, and ability to apply entational skills. Some of the course learning al and critical abilities. Show ffective organizational and taining the course learning ry little or no ability to apply illitle or no ability to apply				
Course Grade Grade Descriptors	A+ to F A B C D	course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational shourse learning outcomes. Show evidence of knowledge to familiar and some unfamiliar sit. Demonstrate general but incomplete comm learning outcomes. Show evidence of some knowledge to most familiar situations. Apply Demonstrate partial but limited command of outcomes. Show evidence of some coherent limited ability to apply knowledge to so presentational skills. Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical abil	lytical and critical abilities and logical thinking wide range of complex, familiar and unfamilist. If ange of knowledge and skills required for an analytical and critical abilities and logical unations. Apply effective organizational and pand of knowledge and skills required for a analytical and critical abilities and logical thoderately effective organizational and presunderately effective organizational ending and logical thinking, but with limited analytic ve problems. Apply limited or barely earned of knowledge and skills required for a titles, logical and coherent thinking. Show we	ng, with evidence of origina illiar situations. Apply highly attaining at least most of the thinking, and ability to apply resentational skills. Itaining most of the course hinking, and ability to apply entational skills. Some of the course learning al and critical abilities. Show ffective organizational and taining the course learning ry little or no ability to apply illitle or no ability to apply				
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D	course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational sk Demonstrate substantial command of a broat course learning outcomes. Show evidence of knowledge to familiar and some unfamiliar sill Demonstrate general but incomplete comm learning outcomes. Show evidence of some knowledge to most familiar situations. Apply to Demonstrate partial but limited command of outcomes. Show evidence of some coherent limited ability to apply knowledge to so presentational skills. Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical abil knowledge to solve problems. Organization appased course	lytical and critical abilities and logical thinking wide range of complex, familiar and unfamilist. If ange of knowledge and skills required for an analytical and critical abilities and logical unations. Apply effective organizational and pand of knowledge and skills required for a analytical and critical abilities and logical thoderately effective organizational and presunderately effective organizational ending and logical thinking, but with limited analytic ve problems. Apply limited or barely earned of knowledge and skills required for a titles, logical and coherent thinking. Show we	ng, with evidence of origina illiar situations. Apply highly attaining at least most of the thinking, and ability to apply resentational skills. Itaining most of the course hinking, and ability to apply entational skills. Some of the course learning al and critical abilities. Show ffective organizational and taining the course learning ry little or no ability to apply illitle or no ability to apply				
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D Fail	course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational shapes and presentational shapes are learning outcomes. Show evidence of knowledge to familiar and some unfamiliar sit open properties of some knowledge to most familiar situations. Apply the learning outcomes. Show evidence of some knowledge to most familiar situations. Apply the outcomes. Show evidence of some coherent limited ability to apply knowledge to solvesentational skills. Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical abil knowledge to solve problems. Organization appased course	lytical and critical abilities and logical thinkin wide range of complex, familiar and unfamilish. d range of knowledge and skills required for if analytical and critical abilities and logical autions. Apply effective organizational and pand of knowledge and skills required for a analytical and critical abilities and logical thoderately effective organizational and pressknowledge and skills required for attaining and logical thinking, but with limited analytic ve problems. Apply limited or barely eland of knowledge and skills required for a tities, logical and coherent thinking. Show vend presentational skills are minimally effective.	ng, with evidence of original illiar situations. Apply highly attaining at least most of the thinking, and ability to apply resentational skills. Itaining most of the course hinking, and ability to apply entational skills. Some of the course learning all and critical abilities. Show fective organizational and training the course learning by little or no ability to apply we or ineffective.				
Course Grade	A+ to F A B C D Fail Lecture-t	course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational shows the course learning outcomes. Show evidence of knowledge to familiar and some unfamiliar sit. Demonstrate general but incomplete commelearning outcomes. Show evidence of some knowledge to most familiar situations. Apply the period outcomes. Show evidence of some knowledge to most familiar situations. Apply the period outcomes. Show evidence of some coherent limited ability to apply knowledge to so presentational skills. Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical abil knowledge to solve problems. Organization appassed course	lytical and critical abilities and logical thinkin wide range of complex, familiar and unfamilish. d range of knowledge and skills required for if analytical and critical abilities and logical autions. Apply effective organizational and pand of knowledge and skills required for a analytical and critical abilities and logical thoderately effective organizational and pressknowledge and skills required for attaining and logical thinking, but with limited analytic ve problems. Apply limited or barely eland of knowledge and skills required for a tities, logical and coherent thinking. Show vend presentational skills are minimally effective.	ng, with evidence of origina illiar situations. Apply highly attaining at least most of the thinking, and ability to apply resentational skills. Itaining most of the course hinking, and ability to apply entational skills. Some of the course learning al and critical abilities. Show ffective organizational and training the course learning ry little or no ability to apply we or ineffective. No. of Hours				

Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		10	CLO 1,2,3		
	Examination	2-hour written exam	50	CLO 1,2,3		
	Presentation		15	CLO 1,2,3		
	Test		25	CLO 1,2,3		
Required/recommended reading and online materials	Lecture notes provided by Course Coordinator M. Lachieze-Rey: Cosmology: A First Course (Cambridge University Press, Cambridge, 1995) M. Rowan-Robinson: Cosmology (Clarendon Press, Oxford, 1996) T. P. Cheng: Relativity, Gravitation & Cosmology - A Basic Introduction (Oxford, 2005)					
Course Website	http://moodle.hk	u.hk				

y (6 credi	ts)			Academic Year	2015		
Physics				Quota			
Dr K M Le	ee, Physi	cs (kmlee@lily.physics.hku.hk,)				
Dr K M Le	Dr K M Lee, Physics						
	To introduce students to the field of general relativity. To provide conceptual skills and analytical necessary for astrophysical and cosmological applications of the theory.						
The Principle of equivalence. Inertial observers in a curved space-time. Vectors and tensors. Par transport and covariant differentiation. The Riemann tensor. The matter tensor. The Einstein gravitatifield equations. The Schwarzschild solution. Black holes. Interior equations for spherically symmetric signaritational waves.							
On succe	ssful cor	npletion of this course, student	s should be able to:				
CLO 1 apply the mathematical and physical ideas of the theory of general relativity for the study of various systems in astrophysics and cosmology							
				stem that cannot	be described by		
			e dynamic interactive	physical processes	s in astrophysics		
Pass in P	HYS205	5 Introduction to relativity and I	PHYS3350 Classical m	echanics			
Y 1st	sem			Examination	Dec		
N							
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							
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.							
Lecture-b	ased cou	ırse					
Activitie	s		Details		No. of Hours		
					36		
					12		
Reading / Self study					80		
Methods	S	Details	Weighting in f		sment Methods o CLO Mapping		
Wethous			course grade	(/0)	o olo mapping		
Assignm	ents		course grade	` '	0 020 mapping 0 1,2,3		
		2-hour written exam	course grade	20 CLC			
	Physics Dr K M Le Dr K M Le To introd necessary The Printransport field equa Gravitatic On succe CLO 1 a CLO 2 a I CLO 3 a I Pass in P Y 1st N A+ to F A B C D Fail Lecture-b Lectures Tutorials	Dr K M Lee, Physic To introduce stude necessary for astronger and covified equations. The Principle of transport and covified equations. The Gravitational wave on successful correctly consuccessful correctly correctly consuccessful correctly correctly consuccessful correctly correctly	Physics Dr K M Lee, Physics (kmlee @lily.physics.hku.hk, Dr K M Lee, Physics To introduce students to the field of general re necessary for astrophysical and cosmological ap The Principle of equivalence. Inertial observer transport and covariant differentiation. The Riem field equations. The Schwarzschild solution. Blad Gravitational waves. On successful completion of this course, student: CLO 1 apply the mathematical and physical i various systems in astrophysics and cos CLO 2 explain the observational effects at the Newtonian gravity from a general relativ CLO 3 demonstrate knowledge and discuss th by using a general relativistic approach Pass in PHYS2055 Introduction to relativity and f Y 1st sem N A+ to F A Demonstrate thorough mastery at an advanc course learning outcomes. Show syrong ana thought, and ability to apply knowledge to a effective organizational and presentational sk B Demonstrate substantial command of a broac course learning outcomes. Show evidence o knowledge to familiar and some unfamiliar sit C Demonstrate general but incomplete comma learning outcomes. Show evidence of some knowledge to most familiar situations. Apply r D Demonstrate partial but limited command of outcomes. Show evidence of some coherent limited ability to apply knowledge to sol presentational skills. Fail Demonstrate little or no evidence of comma outcomes. Lack of analytical and critical abili knowledge to solve problems. Organization a Lecture-based course Activities Lectures Tutorials	Physics Dr K M Lee, Physics (kmlee @lily.physics.hku.hk) Dr K M Lee, Physics To introduce students to the field of general relativity. To provide concessary for astrophysical and cosmological applications of the theory of the Principle of equivalence. Inertial observers in a curved spacettransport and covariant differentiation. The Riemann tensor. The matter field equations. The Schwarzschild solution. Black holes. Interior equat Gravitational waves. On successful completion of this course, students should be able to: CLO 1 apply the mathematical and physical ideas of the theory of various systems in astrophysics and cosmology CLO 2 explain the observational effects at the scale of the Solar Sy Newtonian gravity from a general relativistic point of view CLO 3 demonstrate knowledge and discuss the dynamic interactive by using a general relativistic approach Pass in PHYS2055 Introduction to relativity and PHYS3350 Classical mathought, and ability to apply knowledge to a wide range of complex, fan effective organizational and presentational skills. B Demonstrate substantial command of a broad range of knowledge and sk course learning outcomes. Show evidence of analytical and critical abilities and course learning outcomes. Show evidence of some analytical and critical abilities nowledge to most familiar situations. Apply effective organizations. Show evidence of some coherent and logical trinking, but with limited ability to apply knowledge to solve problems. Apply limite presentational skills. Pail Demonstrate little or no evidence of command of knowledge and skills introductomes. Lack of analytical and critical abilities, logical and coherent the knowledge to solve problems. Apply limite presentational skills. Pail Demonstrate little or no evidence of command of knowledge and skills outcomes. Lack of analytical and critical abilities, logical and coherent the knowledge to solve problems. Organization and presentational skills are not the presentational skills.	Physics Dr K M Lee, Physics (kmlee@lily.physics.hku.hk) Dr K M Lee, Physics To introduce students to the field of general relativity. To provide conceptual skills an necessary for astrophysical and cosmological applications of the theory. The Principle of equivalence. Inertial observers in a curved space-time. Vectors and transport and covariant differentiation. The Riemann tensor. The matter tensor. The Einstield equations. The Schwarzschild solution. Black holes. Interior equations for spherically Gravitational waves. On successful completion of this course, students should be able to: CLO 1 apply the mathematical and physical ideas of the theory of general relativity various systems in astrophysics and cosmology CLO 2 explain the observational effects at the scale of the Solar System that cannot Newtonian gravity from a general relativistic point of view CLO 3 demonstrate knowledge and discuss the dynamic interactive physical processes by using a general relativistic approach Pass in PHYS2055 Introduction to relativity and PHYS3350 Classical mechanics Y 1st sem Examination N A+ to F A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required course learning outcomes. Show strong analytical and critical abilities and logical thinking, with thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply effective organizational and presentational skills. B Demonstrate substantial command of a broad range of knowledge and skills required for attaining nucleones. Show evidence of analytical and critical abilities and logical thinking, knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills required for attaining some of course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, knowledge to familiar situations. Apply moderately effective organizational and presentational skills. Fail Demonstrate partial but limited command		

Required/recommended reading and online materials	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	http://moodle.hku.hk	

PHYS4655 Interstellar medium (6 credits)					Academic Year	2015			
Offering Department	Physics				Quota				
Course Co-ordinator	Dr M H Lee,	Dr M H Lee, Physics (mhlee@hku.hk)							
Teachers Involved	Dr M H Lee,	Dr M H Lee, Physics							
Course Objectives	absorption a	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 an interstellar space, and their astrophysical applications and implications.							
Course Contents & Topics				and radiative propert regions, nebulae, su	, ,	elium and heavie			
Course Learning Outcomes	On success	ful completion of th	nis course, students	s should be able to:					
	CLO 1 exp	ress what exists b	etween stars in spi	ral and elliptical galax	ties				
		oly physical princi ms and ions	iples to describe	excitation/ionization	and de-excitation/	recombination of			
		ognize which pro erstellar medium	cess or processes	s occur or dominate	in which object	or phase of the			
Pre-requisites (and Co-requisites and Impermissible combinations)		YS3651 The phys thermodynamics	•	PHYS3351 Quantum	mechanics and Ph	HY3550 Statistica			
Offer in 2015 - 2016	N				Examination				
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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	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	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learn outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Sh limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational apresentational skills.							
	Fail	·							
Course Type	Lecture-bas	ed course							
Course Teaching	Activities			Details		No. of Hours			
& Learning Activities	Lectures					36			
	Tutorials					12			
	Reading / S	Self study				80			
Assessment Methods and Weighting	Methods	Details		Weighting in course grade		sment Methods to CLO Mapping			
	Assignmen	ts			20 CL	O 1,2,3			
	Essay				15 CL	O 1,2,3			
	Examinatio	n 2-hour writt	en exam		50 CL	O 1,2,3			
	Test				15 CL	O 1,2,3			
Required/recommended reading and online materials		es provided by Cou ysics and Chemisi		r Medium (University	Sciences Book, 20	07)			

PHYS4750 Experimental	Academic Year	2015				
Offering Department	Physics	Quota				
Course Co-ordinator	TBC, Physics ()					

Required/recommended reading	TBC	1	3	` , ,	71 3				
Assessment Methods and Weighting	Methods	Details	Weighting in f		Assessment Methods to CLO Mapping				
Course Teaching & Learning Activities	Activities		Details		No. of Hours				
Course Type	Lecture with I	aboratory compor	nent course						
	Fail								
	D								
	С								
	В								
Grade Descriptors	Α								
Course Grade	A+ to F								
Offer in 2016 - 2017	N								
Offer in 2015 - 2016	N			Examination					
Pre-requisites (and Co-requisites and Impermissible combinations)	TBC								
Course Learning Outcomes	On successfu	On successful completion of this course, students should be able to:							
Course Contents & Topics	TBC	TBC							
Course Objectives	TBC	TBC							
Teachers Involved	TBC, Physics								

PHYS4966 Physics interns	nib (e crec	dits)		Academic Year	2015				
Offering Department	Physics			Quota					
Course Co-ordinator	Dr J C S F	Dr J C S Pun, Physics (jcspun@hku.hk)							
Teachers Involved	NIL, Phys	NIL, Physics							
Course Objectives	taken nor	This capstone course is offered to students majoring in physics, math/physics or astronomy. It should be taken normally in the summer immediately before their final year of study. It provides students with the opportunity to gain working experience in the field of physics or astronomy through interriplacement. Students are expected to use what they have learnt in their majors in this intern.							
Course Contents & Topics	company, astronomy	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 Outcomes	On succes	ssful completion of this course, stude	ents should be able to:						
	CLO 1 apply physics or astronomy knowledge students have learnt in their majors to real working environment								
	CLO 2 help to create, propose or design part of the project he/she is working on during the internship								
	CLO 3 employ effective technical and inter-personal communication skills								
	CLO 3 e	employ effective technical and inter-p	ersonal communication	skills					
(and Co-requisites and	Pass in at Physics M This caps	employ effective technical and inter-particle least 24 credits of advanced level (3 dajor, Mathematics/Physics Major or tone course is for Astronomy, Mathest that a student is allowed to take the	3XXX level or above) di Astronomy Major curric matics/Physics, and Ph	isciplinary core/elect ulum. ysics Majors studen					
(and Co-requisites and Impermissible combinations)	Pass in at Physics M This caps The earlie	t least 24 credits of advanced level (lajor, Mathematics/Physics Major or tone course is for Astronomy, Mathe	3XXX level or above) di Astronomy Major curric matics/Physics, and Ph	isciplinary core/elect ulum. ysics Majors studen					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016	Pass in at Physics M This caps The earlie	i least 24 credits of advanced level (idajor, Mathematics/Physics Major or tone course is for Astronomy, Mathest that a student is allowed to take the	3XXX level or above) di Astronomy Major curric matics/Physics, and Ph	isciplinary core/elect culum. ysics Majors studen heir year 3 study.	ts only.				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017	Pass in at Physics M This caps The earlie Y Sur	i least 24 credits of advanced level (idajor, Mathematics/Physics Major or tone course is for Astronomy, Mathest that a student is allowed to take the	3XXX level or above) di Astronomy Major curric matics/Physics, and Ph	isciplinary core/elect culum. ysics Majors studen heir year 3 study.	ts only.				
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	Pass in at Physics M This caps The earlie Y Sur Y	i least 24 credits of advanced level (idajor, Mathematics/Physics Major or tone course is for Astronomy, Mathest that a student is allowed to take the	SXXX level or above) di Astronomy Major curric matics/Physics, and Ph is capstone course is the sis capstone course is the sistence course is capstone course is the sistence course is capstone course is capstone course is capstone course is sistence course is capstone course is capstone course is capstone course is capstone course is sistence course is capstone course course is capstone course is capstone course is capstone course course course is capstone course cour	isciplinary core/elect culum. hysics Majors studen heir year 3 study. Examination fully handles and carries oration and communication ts set out in the Course	No Exam out the work required on with supervisor(s) Description regarding				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in at Physics M This capsi The earlie Y Sur Y Pass/Fail	Able to apply knowledge to solve problem in the job or assigned by supervisor(s). Colleagues, and clients in the job or assigned by supervisor(s). Colleagues, and clients in the job. Succes working hours, written and oral report,	ASXXX level or above) di Astronomy Major curric matics/Physics, and Ph is capstone course is th is capstone course is th is s in the workplace. Successt Establishes effective collabo isfully fulfils the requirement and evaluation by supervised a grade of "Distinction". Is in the workplace. Fails to h tablish effective collaboratio atisfy the requirements set on	isciplinary core/electulum. sysics Majors studen heir year 3 study. Examination fully handles and carries oration and communication ts set out in the Course sor(s), etc. Students der mandle or carry out the wan or communication with	No Exam out the work required on with supervisor(s) Description regarding monstrating excellen ork required in the job in supervisor(s), other				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	Pass in at Physics M This capsi The earlie Y Sur Y Pass/Fail	Able to apply knowledge to solve problem in the job or assigned by supervisor(s). Colleagues, and clients in the job or assigned by supervisor(s). Colleagues, and clients in the job or assigned by supervisor(s). Colleagues, and clients in the job. Succes working hours, written and oral report, performance in the above would be award. Very limited or no ability to solve problem or assigned by supervisor(s). Fails to es colleagues, or clients in the job. Fails to s hours, written and oral report, or evaluation.	ASXXX level or above) di Astronomy Major curric matics/Physics, and Ph is capstone course is th is capstone course is th is s in the workplace. Successt Establishes effective collabo isfully fulfils the requirement and evaluation by supervised a grade of "Distinction". Is in the workplace. Fails to h tablish effective collaboratio atisfy the requirements set on	isciplinary core/electulum. sysics Majors studen heir year 3 study. Examination fully handles and carries oration and communication ts set out in the Course sor(s), etc. Students der mandle or carry out the wan or communication with	No Exam out the work required on with supervisor(s) Description regarding monstrating excellen ork required in the job in supervisor(s), other				
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in at Physics M This caps! The earlie Y Sur Y Pass/Fail	Able to apply knowledge to solve problem in the job or assigned by supervisor(s). Colleagues, and clients in the job. Succession to a be solve problem or assigned by supervisor(s). Colleagues, and clients in the job. Succession working hours, written and oral report, performance in the above would be award. Very limited or no ability to solve problem or assigned by supervisor(s). Fails to es colleagues, or clients in the job. Fails to shours, written and oral report, or evaluations.	ASXXX level or above) di Astronomy Major curric matics/Physics, and Ph is capstone course is th is capstone course is th is s in the workplace. Successt Establishes effective collabo isfully fulfils the requirement and evaluation by supervised a grade of "Distinction". Is in the workplace. Fails to h tablish effective collaboratio atisfy the requirements set on	isciplinary core/electulum. sysics Majors studen heir year 3 study. Examination fully handles and carries oration and communication ts set out in the Course sor(s), etc. Students der mandle or carry out the wan or communication with	No Exam out the work required on with supervisor(s) Description regarding monstrating excellen ork required in the job in supervisor(s), other				

		w	is expected that students ork at least 160 hours quivalent of 4 weeks full-ti	(or the
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Written report	written report, employer feedback and oral presentation	100	CLO 1,2,3
Required/recommended reading and online materials	To be provided b	y individual project supervisor		
Additional Course Information	internship will be Students who are Enrolment of this	pletion of this course can be co recorded on the student's transcr interested to enrol in this course s course is not conducted via the evant Department/School office a	ipt. This course will be as hould contact the Departn online course selection	ssessed on "Pass/Fail" basis. nent to obtain the approval. system and should be made

PHYS4999 Physics project	(12 cred	its)	Academic Year	2015					
Offering Department	Physics		Quota						
Course Co-ordinator	Prof J W	Prof J Wang, Physics (jianwang@hku.hk)							
Teachers Involved	Various	Various teachers in the department, Physics							
Course Objectives	for those normally themsel the know	This capstone course is offered to students majoring in physics, math/physics or astronomy. It is designed for those who are interested in tackling a research project in physics and/or astronomy. It should be taker normally in their final year of study. It provides students with the opportunity to study a specific problem by themselves, either theoretical, experimental or numerical, under the supervision of an academic staff using the knowledge the student gained in all years of his/her major study. The available projects are close to postgraduate level research in physics and/or astronomy.							
Course Contents & Topics	the con	s interested in taking this course should contact their prospe ents and the nature of their projects in the coming academ h the prospective supervisor and the course coordinator to ta	nic year. They must						
	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 labs under the supervision of a staff member. The student will receive a comprehensive training in advanced experimental techniques, including preparation of samples, determination of physical properties, measurement of small signals								
Course Learning Outcomes	obscured by noise, laser, high-vacuum and low-temperature techniques and so on. Wide reading of the relevant scientific literature and originality in experimental design are expected. On successful completion of this course, students should be able to:								
	CLO 1 plan and execute a theoretical, numerical or experimental research project on a topic in physical or astronomy								
	CLO 2 review the knowledge of a physics or astronomy problem in depth through literature review 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 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 (for theoretical or computational projects)								
	CLO 6 propose and execute physics experiments or astronomical observations, analyze results and sources of errors of the experiment or observation in comparison with predictions (for experimental projects)								
Pre-requisites (and Co-requisites and Impermissible combinations)	Physics This cap	at least 24 credits of advanced level (3XXX level or above) d Major, Mathematics/Physics Major or Astronomy Major curric stone course is for Astronomy, Mathematics/Physics, and Ph iest that a student is allowed to take this capstone course is t	culum. Tysics Majors student						
Offer in 2015 - 2016	Y Y	ear long	Examination	No Exam					
Offer in 2016 - 2017	Υ		,	-					
Course Grade	A+ to F								
Grade Descriptors	A								
	В	Demonstrate substantial grasp of the subject. Evidence of analytical a use of relevant information from sources, showing ability to make							

		secondary interpretations and to quote/reference aptly. Correct use of data of results to draw appropris						
	thinking interpret	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. Apply moderately effective organizational and presentational skills.						
	coheren several	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.						
	lack of a compari	trate evidence of little or no grasp of malytical and critical abilities, logical son of them. Misuse of data and res ational skills are minimally effective or	and cohere sults and/o	ent thinking. Limited use of so r unable to draw appropriate	econdary sources and no critical			
Course Type	Project-based cour	se						
Course Teaching & Learning Activities	Activities			3	No. of Hours			
& Learning Activities	Meeting with supervisor				54			
	Reading / Self stud	dy			126			
Assessment Methods and Weighting	Methods	Details	Details		Assessment Methods to CLO Mapping			
	Oral presentation	including supervisor's cor (10%)	including supervisor's comments (10%)		CLO 2,4,5,6			
	Research report			70	CLO 1,2,3,4,5,6			
Required/recommended reading and online materials	To be provided by	ndividual project supervisor						

PHYS7350 Graduate classical mechanics (6 credits)						Ad	cademic Year	2015	
Offering Department	Physics	Physics Quota							
Course Co-ordinator	TBC, Phy	TBC, Physics ()							
Teachers Involved	TBC, Phy	TBC, Physics							
Course Objectives	TBC								
Course Contents & Topics	TBC								
Course Learning Outcomes	On succe	ssful co	mpletion of this	s course, stud	dents should be a	able to:			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in P	Pass in PHYS4350 Advanced classical mechanics							
Offer in 2015 - 2016	N					Ex	kamination		
Offer in 2016 - 2017	N								
Course Grade	A+ to F								
Grade Descriptors	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 co	urse						
Course Teaching & Learning Activities	Activitie	s		Details				No. of Hours	
Assessment Methods and Weighting	Methods	Methods Details		Weighting in final course grade (%)				ment Methods CLO Mapping	
Required/recommended reading and online materials	ТВС								

Offering Department	Physics					Quota		
Course Co-ordinator	Prof S Q S	Prof S Q Shen, Physics (sshen@hku.hk)						
Teachers Involved	Prof S Q S	Prof S Q Shen, Physics						
Course Objectives			duces postgraduates and se ics, and their applications to s					d techniques in
Course Contents & Topics	symmetry	and co	cover the following topics: D nservation laws, permutation on of relativistic quantum med	symm	etry and identical p			
Course Learning Outcomes	On succes	On successful completion of this course, students should be able to:						
	CLO 1	formula	ate and solve problems in qua	ıntum r	mechanics using D	irac notation		
	CLO 2	examin	e and predict the properties	of ident	tical quantum partic	cles		
	CLO 3	argue t	he importance of symmetry a	nd con	nservation laws in o	uantum med	chanics	
	CLO 4	explain	physical phenomena in the r	nodern	n language of quan	tum mechan	ics	
	CLO 5	analyse	e physical system in a quantu	m med	chanical way			
	CLO 6	recogn	ise the connection between re	elativity	y and quantum med	chanics		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in Pl	HYS435	51 Advanced quantum mecha	nics				
Offer in 2015 - 2016	N					Examinatio	n	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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	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 cours learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to app 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							
Course Type	Lecture-ba	ased co	urse					
Course Teaching	Activities	s		De	etails			No. of Hours
& Learning Activities	Lectures							36
	Tutorials							12
	Reading	Reading / Self study					80	
Assessment Methods and Weighting	Methods	•	Details		Weighting in fi			nent Methods CLO Mapping
	Assignme	ents				30	CLO 1,2	2,3,4,5,6
	Examinat	tion	3-hour written exam			70	CLO 1,2	,3,4,5,6
Required/recommended reading and online materials	J. J. Saku	rai: Mod	vided by Course Coordinator dern Quantum Mechanics (Ac um Mechanics (McGraw-Hill,	ldison-		,		

PHYS7450 Graduate electr	Academic Year	2015				
Offering Department	Physics Quota					
Course Co-ordinator	Prof Z D Wang, Physics (zwang @hku.hk)					
Teachers Involved	Prof Z D Wang, Physics					
Course Objectives	The aim of this course is to provide students with the advanced lever classic electromagnetic field, enabling them to master key analyproblems.		,			
Course Contents & Topics	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 Outcomes	On successful completion of this course, students should be able to:					

	CLO 1 analys	e and solve various electrostatic a	and magnetostatic proble	ems with Green's F	unction				
	CLO 2 compre	CLO 2 comprehend and explain many electromagnetic phenomena							
		ise and comprehend the im rmations, which should be very h			s and gauge				
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in PHYS4450 Advanced electromagnetism							
Offer in 2015 - 2016	Y 2nd sem		E	xamination	May				
Offer in 2016 - 2017	Υ		'						
Course Grade	A+ to F								
Grade Descriptors	cou	nonstrate thorough mastery at an advanc rse learning outcomes. Show strong anal ght, and ability to apply knowledge to a ctive organizational and presentational sk	ytical and critical abilities and wide range of complex, famil	l logical thinking, with e	evidence of original				
	cou	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ab knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational sk							
	lear	nonstrate general but incomplete comma ning outcomes. Show evidence of some wledge to most familiar situations. Apply n	analytical and critical abilities	and logical thinking,	and ability to apply				
	outo limit	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.							
	outo	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability 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	studv			80				
Assessment Methods									
and Weighting	Methods	Details	Weighting in fir course grade (ment Methods CLO Mapping				
	Assignments			30 CLO	CLO 1,2,3				
	Examination	3-hour written exam		70 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 statist	ical med	hanics (6 credits)	Academic Year	2015				
Offering Department	Physics		Quota					
Course Co-ordinator	Prof J Wang, Physics (jianwang @hku.hk)							
Teachers Involved	Prof J Wang, 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 Outcomes	On successful completion of this course, students should be able to:							
	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 PHYS4550 Advanced statistical mechanics							
Offer in 2015 - 2016	N Examination							
Offer in 2016 - 2017	Υ	Υ						
Course Grade	A+ to F	A+ to F						
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all th 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.							

	co	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.				
	lea	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.				
	ou	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.				
	ou	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 & Learning Activities	Activities		Details	No. of Hours		
	Lectures			36		
	Tutorials			12		
	Reading / Sel	f study		80		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignments		15	CLO 1,2,3,4		
	Examination	3-hour written exam	70	CLO 1,2,3,4		
	Test		15	CLO 1,2,3,4		
Required/recommended reading and online materials	R.K. Pathria: S	provided by Course Coordinator Statistical mechanics Id B. Bergersen: Equilibrium statis	tical physics			

• •	sics (6 cre	dits)	Academic Year	2015			
Offering Department	Physics		Quota				
Course Co-ordinator	Prof J Wang, Physics (jianwang@hku.hk)						
Teachers Involved	Prof J Wang, Physics						
Course Objectives	To provide physics.	To provide students with an understanding of more advanced topics in selected areas of solid starphysics.					
Course Contents & Topics	Bloch theory. Nearly free electrons and tight binding model. Band structure calculations for realis systems. The semi-classical model of electron dynamics. Ab initio total energy calculations and oth advanced topics.						
Course Learning Outcomes	On successful completion of this course, students should be able to:						
		discuss various methods to calculate the band structures and the major approximations that have been used					
	CLO 2	CLO 2 discuss various minimization methods					
	CLO 3	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 Introductory solid state physics and PHYS4351 Advanced quantum mechanics						
Offer in 2015 - 2016	Y 2nd	Y 2nd sem Examination May					
Offer in 2016 - 2017	N	N					
Course Grade	A+ to F						
Grade Descriptors							
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive course learning outcomes. Show strong analytical and critical at thought, and ability to apply knowledge to a wide range of compeffective organizational and presentational skills.	oilities and logical thinking, with	evidence of origina			
Grade Descriptors	В	course learning outcomes. Show strong analytical and critical ab thought, and ability to apply knowledge to a wide range of comp	ilities and logical thinking, with olex, familiar and unfamiliar sit required for attaining most of logical thinking, and ability to	evidence of origina uations. Apply highly the course learning			
Grade Descriptors		course learning outcomes. Show strong analytical and critical ab thought, and ability to apply knowledge to a wide range of comp effective organizational and presentational skills. Demonstrate substantial command of the knowledge and skills outcomes. Show evidence of analytical and critical abilities and	vilities and logical thinking, with olex, familiar and unfamiliar site required for attaining most of logical thinking, and ability to onal and presentational skills. and skills required for attaining at abilities and logical thinking	evidence of origina uations. Apply highly the course learning apply knowledge to most of the course, and ability to apply			
Grade Descriptors	В	course learning outcomes. Show strong analytical and critical ab thought, and ability to apply knowledge to a wide range of come effective organizational and presentational skills. Demonstrate substantial command of the knowledge and skills outcomes. Show evidence of analytical and critical abilities and familiar and some unfamiliar situations. Apply effective organization Demonstrate general but incomplete command of knowledge a learning outcomes. Show evidence of some analytical and critic knowledge to most familiar situations. Apply moderately effect	vilities and logical thinking, with olex, familiar and unfamiliar site required for attaining most of logical thinking, and ability to onal and presentational skills. Ind skills required for attaining all abilities and logical thinking ive organizational and presents required for attaining some obut with limited analytical and of the state	evidence of origina uations. Apply highly the course learning apply knowledge to most of the course, and ability to apply tational skills. Apply the course learning oritical abilities. Show			
Grade Descriptors	В	course learning outcomes. Show strong analytical and critical ab thought, and ability to apply knowledge to a wide range of come effective organizational and presentational skills. Demonstrate substantial command of the knowledge and skills outcomes. Show evidence of analytical and critical abilities and familiar and some unfamiliar situations. Apply effective organization Demonstrate general but incomplete command of knowledge a learning outcomes. Show evidence of some analytical and critic knowledge to most familiar situations. Apply moderately effect moderately effective observation skills and techniques. Demonstrate partial but limited command of knowledge and skills outcomes. Show evidence of some coherent and logical thinking, limited ability to apply knowledge to solve problems using limited	vilities and logical thinking, with olex, familiar and unfamiliar sit required for attaining most of logical thinking, and ability to onal and presentational skills. In skills required for attaining all abilities and logical thinking ive organizational and presents required for attaining some of but with limited analytical and of or barely effective organization and skills required for attaining erent thinking. Show very little great thinking.	evidence of origina uations. Apply highly the course learning apply knowledge to most of the course, and ability to apply tational skills. Apply of the course learning critical abilities. Show all and presentational the course learning or no ability to apply or no ability to apply			

Course Teaching & Learning Activities	Activities		Details	No. of Hours
a Learning Activities	Lectures			36
Assessment Methods and Weighting	Tutorials			12
	Reading / Self	study		80
	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments		15	CLO 1,2,3,4
	Examination	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: Introdu	rovided by Course Coordinatection to Solid State Physics (and D.N. Mermin: Solid State		on, 1987)

PHYS7650 Stellar atmosph	eres (6 credi	ts)		Academic Year	2015					
Offering Department	Physics			Quota						
Course Co-ordinator	TBC, Physics	s ()								
Teachers Involved	TBC, Physics	S								
Course Objectives	TBC	TBC								
Course Contents & Topics	TBC	TBC								
Course Learning Outcomes	On successfu	On successful completion of this course, students should be able to:								
Pre-requisites (and Co-requisites and Impermissible combinations)	TBC									
Offer in 2015 - 2016	N	Examination								
Offer in 2016 - 2017	N									
Course Grade	A+ to F									
Grade Descriptors	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, 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.									
		outcomes. Lack of anal	o evidence of command of knowled ytical and critical abilities, logical and olems. Organization and presentation	coherent thinking. Show very little	or no ability to apply					
Course Type	Lecture-base	d course								
Course Teaching & Learning Activities	Activities		Details		No. of Hours					
Assessment Methods and Weighting	Methods	Details	Weighting in course grade		ssment Methods to CLO Mapping					
Required/recommended reading and online materials	TBC									

PHYS7750 Nanophysics (Academic Year	2015					
Offering Department	Physics	Physics Quota					
Course Co-ordinator	Prof S J Xu, Physics (sjxu@hku.hk)	Prof S J Xu, Physics (sjxu@hku.hk)					
Teachers Involved	Prof S J Xu, Physics	Prof S J Xu, Physics					
Course Objectives	nano physics, such as two-dimensional electron gas, quantum H	This course is designed to let fresh postgraduate students know fundamental concepts and principle nano physics, such as two-dimensional electron gas, quantum Hall effects, one-dimensional elestron, quantum wires and nanotubes, zero-dimensional electron systems, single electron effects quantum dots.					
Course Contents & Topics							

	transpor monolay including electron applicati	t properti vers with g carbon systems ons of so	ano physics and quantum size of two-dimensional electron external fields. Quantum Hall nanotubes and semiconducto. Single electron effects. Quantum anning tunneling microscopy in ts of nanomaterials will also be of the second services.	gas for Effect for the second	ormed at heterostructure ects. Physics of one-dir nowires. Fundamental products and nanocrystals. tudy of nano physics. If the structure of	s and within r mensional ele physics of ze Fundamental	novel graphene ectron systems ro-dimensional principles and		
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1	O 1 recall basic concepts and knowledge of dimensionality, density of states, quantum size effect							
	CLO 2	LO 2 identify and compare optical and transport properties of two-dimensional electron gas with external fields, especially quantum Hall effects							
	CLO 3		e the fundamental principles opy in the study of nano physics		d important application	ns of scann	ing tunneling		
	CLO 4		the basic physics of one-dimer ductor nanowires	nsion	al electron systems inclu	ding carbon r	anotubes and		
	CLO 5	understa electron	and the central physics of zer effects	ro-dir	nensional quantum dot	s and nanoc	rystals, single		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	PHYS43	51 Advanced quantum mechanio	cs an	d PHYS3551 Introductor	y solid state p	hysics		
Offer in 2015 - 2016	N				Exam	ination			
Offer in 2016 - 2017	N								
Course Grade	A+ to F								
Grade Descriptors	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 course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to a 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 coulearning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to ap knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.						nd ability to apply		
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilitie limited ability to apply knowledge to solve problems. Apply limited or barely effective organization presentational skills.					cal abilities. Show			
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining th outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or knowledge to solve problems. Organization and presentational skills are minimally effective or ineffe				no ability to apply				
Course Type	Lecture-	based co	urse						
Course Teaching	Activiti	es		Det	ails		No. of Hours		
& Learning Activities	Lecture	s					36		
	Tutorial	s					12		
		g / Self st	udy				80		
Assessment Methods and Weighting	Method	ls	Details		Weighting in final course grade (%)		nent Methods CLO Mapping		
	Assignr	nents			10	CLO 1,2	2,3,4,5		
	Essay				20	CLO 1,2			
	Examin	ation			70	CLO 1,2			
Required/recommended reading and online materials	Lecture	notes pre	pared by Course Coordinator		,				

ENVS3006 Environmental	NVS3006 Environmental radiation (6 credits)						
Offering Department	Physics	Quota					
Course Co-ordinator	Dr J K C Leung, Physics (jkcleung@hku.hk)						
Teachers Involved	Dr J K C Leung, Physics						
Course Objectives	In this course, students will learn about various kinds of radiation techniques to detect them, the methods to trace them and to asse the ways to reduce the hazard in events of nuclear accidents or incidents.	ss their hazard to the e	•				
Course Contents & Topics	The course will cover naturally occurring radiation sources and nuclear power plants; transport models for radionuclides in the impact to the environment; radiation risk assessment and em measuring low level radioactivities; nuclear techniques in ecology; a species and non-human species.	environment; nuclear a ergency preparedness;	ccidents and in techniques for				

Course Learning Outcomes	On succes	On successful completion of this course, students should be able to:								
	CLO 1 re	ealise sourc	es and transport of radionu	uclides in	the environment					
	CLO 2 e	CLO 2 explain and assess the impact to the environment from the use of nuclear energies								
	CLO 3 d	CLO 3 detect and measure low level radioactivities in environmental samples								
	CLO 4 ju	stify, optim	ize, and assess the risk of	using rad	iation and nuclear	techno	ologies			
	CLO 5 c	ompare and	d contrast the environmenta	al impacts	from nuclear ene	ergy and	d other for	ms of energy		
Pre-requisites (and Co-requisites and Impermissible combinations)		ass in PHYS2265 Modern physics or CHEM2041 Principles of chemistry or ENVS2001 Environmental data analysis								
Offer in 2015 - 2016	N	Examination								
Offer in 2016 - 2017	N									
Course Grade	A+ to F									
Grade Descriptors	A	course lear thought, an effective or	te thorough mastery at an advan ning outcomes. Show strong ana d ability to apply knowledge to a ganizational and presentational s to draw appropriate and insightfu	alytical and a wide range kills. Apply	critical abilities and log e of complex, familiar highly effective lab ski	gical thinl and unfa	king, with ev imiliar situati	idence of original ons. Apply highly		
	В	course lear knowledge	te substantial command of a broa ning outcomes. Show evidence of to familiar and some unfamiliar so so skills and techniques. Correct us	of analytical situations. A	and critical abilities a apply effective organization	nd logica ational a	ıl thinking, ar nd presentat	nd ability to apply		
	С	learning ou knowledge moderately	tcomes. Show evidence of some to most familiar situations. App	e command of knowledge and skills required for attaining most of the cour of some analytical and critical abilities and logical thinking, and ability to ap ns. Apply moderately effective organizational and presentational skills. Ap echniques. Mostly correct but some erroneous use of data and results to dr				nd ability to apply onal skills. Apply		
	D	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learni outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Sho limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational a presentational skills. Apply partially effective lab skills and techniques. Limited ability to use data and results to dra appropriate conclusions.						cal abilities. Show ganizational and		
	Fail	outcomes. knowledge minimally	te little or no evidence of comm Lack of analytical and critical abil to solve problems. Organization effective or ineffective lab skills conclusions.	lities, logical and prese	I and coherent thinking entational skills are m	g. Show vinimally	very little or i effective or	no ability to apply ineffective. Apply		
Course Type	Lecture wi	th laborator	y component course							
Course Teaching	Activities			Details				No. of Hours		
& Learning Activities	Lectures	•	Details					36		
	Laborator	v						2		
	Field worl	•						8		
	Tutorials							8		
		Self study						80		
Assessment Methods and Weighting	Methods		Details		Weighting in f			nent Methods CLO Mapping		
	Assignme	ents			<u> </u>	20		1,2,4,5		
	Examinat		2-hour written exam			60		1,2,4,5		
	Laborator					10	CLO 1,2,4,5 CLO 2,3			
						10		2,4,5		
Required/recommended reading and online materials	Sources (A Robert C. David Boo	Presentation Merril Eisenbud and Thomas Gesell: Environmental Radioactivity: from Sources (Academic Press, 1997) Robert C. Morris: The Environmental Case for Nuclear Power (Paragon Hou David Bodansky: Nuclear Energy - Principles, Practices and Prospects 1996)					l, Industria	al, and Military		
	http://moo	Press, 1996)								

ENVS3010 Sustainable ene	Academic Year	2015			
Offering Department	Physics Quota				
Course Co-ordinator	Prof A B Djurisic, Physics (dalek@hku.hk)				
Teachers Involved	Prof A B Djurisic, Physics				
Course Objectives	In this course, the students will learn about sustainability and envitechnologies, including conventional energy sources as well as rene The technological challenges, potential for future development, and regional, and global) will be discussed.	ewable and/or clean e	energy sources		
Course Contents & Topics	The course will cover energy production and use, environmental immethods for making them more sustainable, clean fuels, electrons				

		technologies (with emphasis on biomass, wind and solar energy), hydrogen, energy storage, and energy conservation.								
Course Learning Outcomes	On successful completion of this course, students should be able to:									
	CLO 1	define t	he concept of sustainable devel	opment						
	CLO 2	CLO 2 explain the challenges and potential for development of various energy technologies								
	CLO 3	compar	e the environmental impact of c	onventional and nev	v energy tec	hnologies				
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in PHYS2260 Heat and waves or CHEM2041 Principles of chemistry or ENVS2001 Environmenta field and lab course or ENVS2002 Environmental data analysis								
Offer in 2015 - 2016	Y 2r	nd sem			Examinat	ion	May			
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	A	course	nstrate thorough mastery at an advanc e learning outcomes. Show strong anal nt, and ability to apply knowledge to a ve organizational and presentational ski	ytical and critical abilities wide range of complex,	and logical thi	inking, with e	evidence of original			
	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.								
	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	outcor	nstrate little or no evidence of comma mes. Lack of analytical and critical abilit edge to solve problems. Organization at	ies, logical and coherent	thinking. Show	very little or	r no ability to apply			
Course Type	Lecture-	based co	urse							
Course Teaching	Activiti	es		Details			No. of Hours			
& Learning Activities	Lecture						36			
	Tutorial	S					12			
	Reading	g / Self st	udy				80			
Assessment Methods	Method	le	Details	Weighting ir	n final	Δεερεε	ment Methods			
and Weighting	Wethod	15	Details	course grad			CLO Mapping			
	Examin	ation	2-hour written exam		50	CLO	1,2,3			
	Present	ation			50	CLC	2,3			
Required/recommended reading and online materials	Godfrey G. Boyle (The Op	Presentation 50 CLO 2,3 Lecture notes provided by Course Coordinator Godfrey Boyle: Renewable Energy: Power for a Sustainable Future (Oxford University Press, 2003) G. Boyle, B. Everett, and J. Ramage: Energy Systems and Sustainability: Power for a Sustainable F (The Open University, 2003) R. M. Dell and D. A. J. Rand: Clean Energy (The Royal Society of Chemistry, 2004)								

Offering Department	Faculty	asoning (6 credits)		Quota						
Course Co-ordinator	,	am, Statistics & Actuarial Science	hrntlkf@hku hk)	Quota						
Teachers Involved	Dr K F Lam, Statistics & Actuarial Science Dr W M Y Cheung, Faculty of Science Dr R K W Lui, Faculty of Science Dr N K Tsing, Mathematics									
Course Objectives	and impa	The objectives are to give students a holistic view of the science discipline in terms of its nature, concept and impact on civilization and society; to equip students with basic skills of logical and quantitative reasoning; and to introduce to students mathematical and statistical methods for science studies are research.								
Course Contents & Topics	Part I: Th - Demarc - Shared - Scientif - The role - The role - Founda - Mathen - Mathen - Guessti - Differer - Linear a - Calculu - Fractals - Probabi - Probabi - Statisti - Confide - Hypothe	ne nature and methodology of science ration between science and non-soft features of the sciences ic method e of mathematics in the historical duantitative reasoning matics with topics selected from tion of mathematics, natics and advancement of science natical modelling - an introduction, mation, ince equations, algebra and matrices, is and differential equations, and/or and Chaos.	ience evelopment of science - an introduction,							
		cal modelling, and use and misuse	of statistics							
Course Learning Outcomes	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									
		,								
		apply logical and quantitative reamathematical terms, and to interpr		th real life and scien	tific problems in					
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL (This cou		et their solutions ts taking a Science majo							
(and Co-requisites and	NIL (This cor Students	mathematical terms, and to interpr	et their solutions ts taking a Science majo							
(and Co-requisites and Impermissible combinations)	NIL (This counts)	mathematical terms, and to interpr urse is compulsory for all studen should take this course in their firs	et their solutions ts taking a Science majo	or offered by the Fa	culty of Science					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016	NIL (This constudents Y 1s	mathematical terms, and to interpr urse is compulsory for all studen should take this course in their firs	et their solutions ts taking a Science majo	or offered by the Fa	culty of Science					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017	NIL (This counts Students Y 1s	mathematical terms, and to interpr urse is compulsory for all studen should take this course in their firs	et their solutions ts taking a Science major it year.) ttensive knowledge and skills a critical abilities and logical thin tions. Carry out computations	Examination Equired for attaining all king, and ability to apply k	culty of Science Dec May the course learning moveledge to a wide					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	NIL (This council Students) Y 1s Y A+ to F	mathematical terms, and to interpresent the interpresent	et their solutions ts taking a Science major it year.) ettensive knowledge and skills in critical abilities and logical thin tions. Carry out computations in a broad range of knowledge and ence of analytical and critical abiliar situations. Carry out compu	Examination Examination required for attaining all king, and ability to apply a carefully and correctly. A skills required for attaining silities and logical thinking tations mostly in a careful	Dec May the course learning knowledge to a wide pply highly effective and ability to apply and correct way, but					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	NIL (This cot Students Y 1s Y A+ to F	Demonstrate thorough mastery of evolutiones. Show strong analytical and range of familiar and unfamiliar situa organizational and presentational skills. Demonstrate substantial command of course learning outcomes. Show evid knowledge to familiar and some unfamiliar some unfamiliar some unfamiliar some unfamiliar some unfamiliar some unfamiliar and some unfamiliar	et their solutions Its taking a Science major Its taking a Science major Its taking a Science major Its tyear.) Its taking a Science major Its tyear. Its taking a Science major Its tyear.) Its taking a Science major Its tyear.) Its tyear. Its ty	Examination Examination Examination required for attaining all king, and ability to apply I carefully and correctly. A skills required for attaining slitties and logical thinking attains mostly in a careful al and presentational skills. kills required for attaining illities and logical thinking,	Dec May the course learning mowledge to a wide pply highly effective g at least most of the and ability to apply and correct way, but most of the course and ability to apply					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	NIL (This cot Students Y 1s Y A+ to F A B	Demonstrate thorough mastery of evolutional familiar situational minimum and some unfamiliar situational some familiar and some unfamiliar situational ending to the some unfamiliar situational ending to the some unfamiliar and some unfamiliar situational some unfamiliar and some unfamiliar some unfami	et their solutions ts taking a Science major at year.) ttensive knowledge and skills a critical abilities and logical thin tions. Carry out computations a broad range of knowledge and ence of analytical and critical ab illiar situations. Carry out compu ors. Apply effective organizations command of knowledge and sk some analytical and critical ab illiar situations. Carry out compu ors. Apply effective organizations command of knowledge and skills requ and of knowledge and skills requ erent and logical thinking, but w live problems. Commit some sui	Examination Examination Examination required for attaining all king, and ability to apply k carefully and correctly. A skills required for attaining illities and logical thinking all and presentational skills. kills required for attaining illities and logical thinking, mputational errors. Apply uired for attaining some of ith limited analytical and countries.	the course learning knowledge to a wide pply highly effective g at least most of the and ability to apply and correct way, but most of the course and ability to apply moderately effective the course learning ritical abilities. Show					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	NIL (This council Students) Y 1s Y A+ to F A B	Demonstrate thorough mastery of exoutcomes. Show strong analytical and roomstrate substantial command of course learning outcomes. Show evidence of knowledge to most familiar situations organizational and presentational skills. Demonstrate substantial command of course learning outcomes. Show evidence of knowledge to familiar and some unfam commit some minor computational error bearing outcomes. Show evidence of knowledge to most familiar situations. Organizational and presentational skills. Demonstrate general but incomplete learning outcomes. Show evidence of some colimited ability to apply knowledge to sufficience of some colimited ability to apply knowledge to sufficience of some colimited ability to apply knowledge to sufficience of some colimited ability to apply knowledge to sufficience of some colimited ability to apply knowledge to sufficience of some colimited ability to apply knowledge to sufficience of some colimited ability to apply knowledge to sufficience of some colimited ability to apply knowledge to sufficience of some colimited ability to apply knowledge to sufficience of some colimited ability to apply knowledge to sufficience of some colimited ability to apply knowledge to sufficience of some colimited ability to apply knowledge to sufficience of some colimited ability to apply knowledge to sufficience of some colimited ability to apply knowledge to sufficience of some colimited commendations.	et their solutions Its taking a Science major of tyear.) Itensive knowledge and skills a critical abilities and logical thin tions. Carry out computations a broad range of knowledge and ence of analytical and critical abilitar situations. Carry out computes. Apply effective organizations command of knowledge and si some analytical and critical ab Commit a number of minor column of knowledge and skills requerent and logical thinking, but whe problems. Commit some subsentational skills.	Examination Examination Examination Examination required for attaining all king, and ability to apply be carefully and correctly. A skills required for attaining itations mostly in a careful all and presentational skills. kills required for attaining illities and logical thinking, mputational errors. Apply uired for attaining some of with limited analytical and cobstantial computational errors. Kills required for attaining thinking. Show very little	the course learning knowledge to a wide pply highly effective and ability to apply and correct way, but most of the course and ability to apply moderately effective the course learning ritical abilities. Show ors. Apply limited or the course learning or no ability to apply					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	NIL (This cot Students Y 1s Y A+ to F A B C D	Demonstrate thorough mastery of evolutiones. Show evidence of knowledge to solve problems. Committed ability to apply knowledge to solve problems. Committed ability to apply knowledge to solve problems. Committed and presentational skills.	et their solutions Its taking a Science major of tyear.) Itensive knowledge and skills a critical abilities and logical thin tions. Carry out computations a broad range of knowledge and ence of analytical and critical abilitar situations. Carry out computes. Apply effective organizations command of knowledge and si some analytical and critical ab Commit a number of minor column of knowledge and skills requerent and logical thinking, but whe problems. Commit some subsentational skills.	Examination Examination Examination Examination required for attaining all king, and ability to apply be carefully and correctly. A skills required for attaining itations mostly in a careful all and presentational skills. kills required for attaining illities and logical thinking, mputational errors. Apply uired for attaining some of with limited analytical and cobstantial computational errors. Kills required for attaining thinking. Show very little	the course learning knowledge to a wide pply highly effective and ability to apply and correct way, but most of the course and ability to apply moderately effective the course learning ritical abilities. Show ors. Apply limited or the course learning or no ability to apply or no ability to apply moderately effective the course learning or no ability to apply or no ability to apply or no ability to apply					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	NIL (This council Students of the students of	Demonstrate thorough mastery of evolucomes. Show strong analytical and range of familiar and unfamiliar situal organizational and presentational skills. Demonstrate substantial command of course learning outcomes. Show evidence of knowledge to familiar and some unfamiliar situations. Show evidence of knowledge to most familiar situations. Organizational and presentational skills. Demonstrate general but incomplete learning outcomes. Show evidence of knowledge to most familiar situations. Organizational and presentational skills. Demonstrate partial but limited commoutcomes. Show evidence of some colimited ability to apply knowledge to subarely effective organizational and pre Demonstrate little or no evidence of outcomes. Lack of analytical and critic knowledge to solve problems. Comminimally effective or ineffective.	et their solutions Its taking a Science major of tyear.) It tensive knowledge and skills a critical abilities and logical thin tions. Carry out computations of a broad range of knowledge and ence of analytical and critical abilitier situations. Carry out computes. Apply effective organizations of the command of knowledge and shad of knowledge and shad of knowledge and skills requerent and logical thinking, but whe problems. Commit some subsentational skills.	Examination Examination Examination Examination required for attaining all king, and ability to apply be carefully and correctly. A skills required for attaining itations mostly in a careful all and presentational skills. kills required for attaining illities and logical thinking, mputational errors. Apply uired for attaining some of with limited analytical and cobstantial computational errors. Kills required for attaining thinking. Show very little	the course learning knowledge to a wide pply highly effective g at least most of the, and ability to apply and correct way, but most of the course and ability to apply moderately effective the course learning ritical abilities. Show rors. Apply limited or the course learning or no ability to apply entational skills are					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors Course Type	NIL (This cot Students Y 1s Y A+ to F A B C D	Demonstrate thorough mastery of exoutcomes. Show strong analytical and range of familiar and unfamiliar situal organizational and presentational skills. Demonstrate substantial command of course learning outcomes. Show evidence of course learning outcomes. Show evidence of knowledge to familiar and some unfamiliar situations, organizational and presentational error personal stange of the strength of the streng	et their solutions Its taking a Science major of tyear.) Itensive knowledge and skills a critical abilities and logical thin tions. Carry out computations a broad range of knowledge and ence of analytical and critical abilitar situations. Carry out computes. Apply effective organizations command of knowledge and si some analytical and critical ab Commit a number of minor column of knowledge and skills requerent and logical thinking, but whe problems. Commit some subsentational skills.	Examination Examination Examination Examination required for attaining all king, and ability to apply be carefully and correctly. A skills required for attaining itations mostly in a careful all and presentational skills. kills required for attaining illities and logical thinking, mputational errors. Apply uired for attaining some of with limited analytical and cobstantial computational errors. Kills required for attaining thinking. Show very little	the course learning knowledge to a wide pply highly effective and ability to apply and correct way, but most of the course and ability to apply moderately effective the course learning ritical abilities. Show ors. Apply limited or the course learning or no ability to apply or no ability to apply moderately effective the course learning or no ability to apply or no ability to apply or no ability to apply					

Assessment Methods and Weighting	Reading / Self st	udy	100		
	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping	
	Assignments		20	CLO 1,2,3,4	
	Examination	2-hour examination	40	CLO 1,2,4	
	Project reports		20	CLO 1,3,4	
	Test		20	CLO 1,2	
Required/recommended reading and online materials	TBC				

SCNC1112 Fundamentals of	f moder	rn sc	cience (6 cr	edits)			Academic Year	2015
Offering Department	Faculty						Quota	
Course Co-ordinator	Dr J C S	S Pun	n, Physics <i>(jcs</i>	pun @hku.hk)			
Teachers Involved	Prof A S Prof A S Dr G W	S C C S T W / Porte	n (2nd sem), P Cheung (1st & : Jong (1st sem) er (2nd sem), I (1st sem), Earl	2nd sem), Ch), Biological S Faculty of Sc	Sciences			
Course Objectives	sciences sciences used in fundame	e. This es, che n vario nental	s course add emistry, and bous discipline laws of each	opts an interiology, and so described his discipline,	grated appro- focuses on the e the diverse the historica	each and encon e general princip phenomena an	web of knowledge passes physics, a les and unifying cor d objects in the na and the modern fr nd highlighted.	astronomy, ea ncepts of scier atural world. T
Course Contents & Topics	(2) Fund - Structu - The qu - Elemen (3) Atom - Matters - Chemin - Importa - Nanosa (4) DNA - Molecu - Genom (5) Cells (6) Orga - The ori - Ecolog (7) Earth - Solid E - Earth's	dame cure of uanture trans and trans	Im world particles and and molecules did atoms: The ponds and cheir nolecules: wat the properties of life and DNA; Gen I systems and environment did Beyond particles and particles and particles and particles and particles and environment did Beyond particles and particles and the gen and the g	standard mo periodic table mical reaction er, carbon, m chnology metics and inh ment of life t sphere and h	del ns olecular cluste eritance			
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	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							
	CLO 2 understand and be familiar with the fundamental scientific principles and concepts							
	CLO 3 appreciate the diversity of different scientific disciplines and develop multidisciplinary and interdisciplinary perspectives on scientific issues							
	CLO 4	critic	cally and creat	tively apprais	e received ide	as and establish	ed knowledge	
	CLO 5		elop curiosity ors and as a fo			ciation of science	ces as related to d	ifferent Science
Pre-requisites	NIL							
(and Co-requisites and Impermissible combinations)			e is compulso			a Science major	offered by the Fa	culty of Scien
Offer in 2015 - 2016			m 2nd sem		,		Examination	Dec Ma
Offer in 2016 - 2017	Υ							1
Course Grade	A+ to F							
Grade Descriptors	A	(6	outcomes. Show ability to apply kr	strong analytication nowledge to a way was. Critical us	al and critical abi	lities and logical thir nplex, familiar and ur	equired for attaining all iking, with evidence of confamiliar situations. Apply riate and insightful conci	riginal thought, a highly effective l

	cou	nonstrate substantial command of a b rse learning outcomes. Show evidend wledge to familiar and some unfamilia ults to draw appropriate conclusions. A	es and logical kills and techni	thinking, and ability to apply ques. Correct use of data of					
	C Den lear kno erro	nonstrate general but incomplete conning outcomes. Show evidence of swilledge to most familiar situations. Appeace use of data and results to drasentational skills.	mmand of knowledge and skills one analytical and critical abilitie oply moderately effective lab skills	required for a s and logical t s and techniqu	ttaining most of the course hinking, and ability to apply es. Mostly correct but some				
	outo limit to u	nonstrate partial but limited command comes. Show evidence of some coher ed ability to apply knowledge to solve use data and results to draw appro- sentational skills.	ent and logical thinking, but with I e problems. Apply partially effective	imited analytic ve lab skills an	al and critical abilities. Show d techniques. Limited ability				
	outo kno data								
Course Type	Lecture with lab	oratory component course							
Course Teaching	Activities		Details	Details					
& Learning Activities	Lectures				36				
	Tutorials				12				
	Reading / Self	study			94				
	Assessment		1 hour in-class quiz		1				
Assessment Methods and Weighting	Methods	Details	Weighting in fir course grade (Assessment Methods to CLO Mapping				
	Assignments	tutorials and homework		20	CLO 1,2,3,4,5				
	Examination			50 CLO 1					
	Presentation	project presentation		20	CLO 1,2,3,4,5				
	Test			10	CLO 1,2,3,4,5				
Required/recommended reading and online materials	References: Into Biology: Cond Benjamin/Cumr	nces: An Integrated Approach egrated Science by Tillery, En- epts and Connections by nings) Atoms First Approach by Zumo	ger, & Ross 5th Edition (20 Campbell, Mitchell,	11, McGrav & Reece	vHilĺ)				

SCNC1113 The big histor has ever happened (6 cre	Academic Year	2015						
Offering Department	Faculty	Quota	50					
Course Co-ordinator	Dr W M Y Cheung, Faculty (willmyc@hku.hk)							
Teachers Involved	Dr C W Chan, Faculty of Science Dr W M Y Cheung, Faculty of Science Dr B C H Ng, Faculty of Science Prof Q A Parker, Physics							
Course Objectives	By exploring the Big History of our planet: from the Big Bang of the chemical substances, through the evolution of various species on I human society, the course aims to: (1) discuss the process of scientific discovery, and how our current established; (2) develop students' appreciation of the multi-disciplinary nature of s (3) develop students' appreciation of the importance of science formulating policies in the society, and solving the future problems of (4) increase scientific literacy.	Earth, to the established body of knowledge science; and technology to	shment of model about Nature wa					
Course Contents & Topics	Part I: From the Cosmos to the Atom Main theme: How fundamental interactions between the building blocks of matter shape the Universe too as we know it; Topics include: Big bang, nucleosynthesis, cosmic expansion, cooling of the universe, star formation, a thermal equilibrium of our planet Earth.							
	Part II: From the Atom to Life Main theme: How we understand the transition from non-living matter to the diversified biosphere on today; Topics include: Origin of life, evolution, natural selection and tree of life.							
	Part III: From Life to Mind to Society Main theme: How our modern civilised society emerges through the development of intellige accumulation of knowledge; how science, technology, human society and environment influe another; Topics include: Neural network and the emergence of intelligence, historical development of 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 ch							

	Topics incl	ude: Stu	nankind that could be addresse udents will attend one of severa t, climate change, energy crisis	al para	Illel modules on topics		heir interests, such			
Course Learning Outcomes	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								
			d how different science disciple humankind to understand Na		fit and emerge from o	ne anoth	er as a collective			
			ssess the mutual influence be y as well as the making of scie			ciety, the	role of science in			
			some of the major challenges f y perspective	aced I	by humankind, and disc	cuss solu	tions from a multi-			
		st claim sciplines	s and engage in historical a	nalysis	s based on theories a	nd practi	ces from multiple			
Pre-requisites (and Co-requisites and Impermissible combinations)	Biology, Co	ombined	n at least one science subject /Integrated Science or equivalent offered to students in the 6901	ent)			Physics, Chemistry			
Offer in 2015 - 2016	Y 1st s	sem			Examina	ation	No Exam			
Offer in 2016 - 2017	Υ				'					
Course Grade	A+ to F									
Grade Descriptors	A									
	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. Carry out computations mostly in a careful and correct way, but commit some minor computational errors. 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 knowledge to most familiar situations. Commit a number of minor computational errors. 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. Commit some substantial computational errors. 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. Commit serious computational errors. Organization and presentational skills are minimally effective or ineffective.								
Course Type	Lecture-ba	sed cou	rse							
Course Teaching	Activities			Deta	No. of Hours					
& Learning Activities	Lectures						36			
	Tutorials									
	Reading / Self study									
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Asse	essment Methods to CLO Mapping			
	Assignme	nts	About 3 reading assignment be given. Students will the assessed in various forms as drawing mind maps, quizzes or reflective journals.	n be such short	40	CLC) 1,2,3,4,5,6			
	Presentati	on	Tutorial participation		10		1,2,3,4,5,6			
	Project rep	oorts			30	CL	O 1,3,4,5,6			
	Test				20	CL	O 1,2,3,4,6			
Required/recommended reading and online materials	Charles Da Eric R. Ka Company) Fred Spier: David Chr (McGraw-F	Steven Weinberg: The First Three Minutes: A Modern View of the Origin of the Universe (Basic Books) Charles Darwin: The Origin of Species Eric R. Kandel: In Search of Memory: The Emergence of a New Science of Mind (W. W. Norton								

SCNC2121 Sustainable food	Academic Year	2015	
Offering Department	Faculty	Quota	32

Teachers Involved		Dr H S El-Nezami, Biological Sciences								
0			UBC Faculty of Land and Fo							
Course Objectives	sustainab thriving, u instructor	This course is designed to provide students with the opportunity to experience the inner-workings sustainable, campus farming operation, and to make connections between the ecosystems that nouris thriving, urban communities surrounding the farm. Students will participate in plenary sessions with constructors and guest lecturers from the UBC Faculty of Land and Food Systems, in guided guiscussions, field trips on and off-campus, and in a variety of seasonal, hands-on farming activities.								
Course Contents & Topics	sessions, is the site market S including innovative Students Market to context. The main meet coucontribute	The MacMillan building, home of the UBC Faculty of Land and Food Systems, will be the site of the pessions, guest speaker lectures, and morning group discussion sessions. The south campus farm is the site of the majority of farming activities, including afternoon group discussions, harvest Fridamarket Saturdays. Students will have a chance to explore the UBC campus sustainability hot including the LFS orchard garden, the world-class CIRS green building, Place Vanier, home innovative campus chef, Steve Golieb, and the wiggle worm project in the Student Union Buildin Students will also venture off-campus to two the Vancouver Farmers' Market and to Granville Island Market to provide a comparative view of marketing systems and the regionally grounded food context. The main approach to learning with this course is student-centered learning and hands-on experier meet course learning objectives, students are expected to attend and participate in all sessic contribute to group discussions and the group oral presentation, and to complete a series of rejournals on each of the four main course themes-soils, biodiversity, seeds, marketing.								
Course Learning Outcomes	On succe	ssful co	mpletion of this course, stude	ents sho	uld be able to:					
			underlying agroecosystem of sustainable farming	concepts	and soil science fundar	mentals wit	h principles and			
		observe arm sett	and compare multiple mode ing	els of aç	gricultural food production	n in an urb	an and campus			
	CLO 3 i	dentify n	nultiple strategies for creating	g on-farr	n biodiversity					
			rate a basic understanding o							
		CLO 5 demonstrate the ability to perform a select set of basic crop maintenance, harvest, washing, packing techniques in a sustainable campus farm setting								
	CLO 6	CLO 6 demonstrate best practices with post-harvest handling and food safety protocols								
Pre-requisites (and Co-requisites and Impermissible combinations)		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.								
Offer in 2015 - 2016	Y Su	mmer			Examin	ation	No Exam			
Offer in 2016 - 2017	Υ									
Olici III 2010 2017										
	A+ to F									
Course Grade Grade Descriptors		operat Ability assess	understanding of the basics from ions. Ability to perform crop mainter to demonstrate solid team-based sment components. Ability to synthetives for further studies in agriculture	nance, har skills for size the le	vest, washing, and packing in a performance of fieldwork, and ssons learned during the cours	sustainable of distinct perfo	campus farm setting. ormance in different			
Course Grade	A+ to F	operation Ability assess objection Clear operation Ability	ions. Ability to perform crop mainter to demonstrate solid team-based sment components. Ability to synthe	nance, har skills for size the le food and sustainab nance, har	vest, washing, and packing in a performance of fieldwork, and ssons learned during the cours human health. le farming to marketing strate, vest, washing, and packing in a	a sustainable of distinct performance and articular gies used by a sustainable of	campus farm setting. ormance in different te individual learning sustainable farming campus farm setting.			
Course Grade	A+ to F	operat Ability assess object Clear operat Ability assess Under operat Satisfa	ions. Ability to perform crop mainter to demonstrate solid team-based sment components. Ability to synthe lives for further studies in agriculture understanding of the basics from ions. Ability to perform crop mainter to demonstrate solid team-based	nance, har skills for size the le food and sustainab nance, har skills for tainable f	vest, washing, and packing in a performance of fieldwork, and ssoons learned during the cours human health. It farming to marketing strateging vest, washing, and packing in a performance of fieldwork, and arming to marketing strateging vest, washing, and packing in a	sustainable of distinct performance and articular gies used by a sustainable of distinct performs used by a sustainable of a sustainable of a sustainable of distinct performs used by a sustainable of distinct performance.	campus farm setting, ormance in different te individual learning sustainable farming campus farm setting, ormance in different sustainable farming campus farm setting.			
Course Grade	A+ to F A B	operat Ability assess object Clear operat Ability assess Under operat Satisfa differe	ions. Ability to perform crop mainter to demonstrate solid team-based sment components. Ability to synthetives for further studies in agriculture understanding of the basics from ions. Ability to perform crop mainter to demonstrate solid team-based sment components. standing of the basics from sustions. Ability to perform crop mainter ions. Ability to perform crop mainter actory demonstration of team-base	nance, har skills for size the le, food and sustainab nance, har skills for tainable f nance, har ad skills for	vest, washing, and packing in a performance of fieldwork, and sssons learned during the cours human health. It farming to marketing strate, vest, washing, and packing in a performance of fieldwork, and arming to marketing strategie vest, washing, and packing in a for performance of fieldwork,	sustainable of distinct performed and articular gies used by a sustainable of distinct performed used by a sustainable of and satisfact	campus farm setting. ormance in different te individual learning sustainable farming campus farm setting. ormance in different sustainable farming campus farm setting. ory performance in			
Course Grade	A+ to F A B	operat Ability assess object Clear operat Ability assess Under operat Satisfa differe Knowi perfori	ions. Ability to perform crop mainter to demonstrate solid team-based sment components. Ability to synthe trees for further studies in agriculture understanding of the basics from ions. Ability to perform crop mainter to demonstrate solid team-based sment components. standing of the basics from sustions. Ability to perform crop mainter ions. Ability to perform crop mainter actory demonstration of team-basent assessment components.	nance, har skills for size the le of food and sustainab nance, har skills for tainable f nance, har ad skills to be farmin ponents.	vest, washing, and packing in a performance of fieldwork, and sissons learned during the cours human health. It farming to marketing strategivest, washing, and packing in a performance of fieldwork, and arming to marketing strategie vest, washing, and packing in a for performance of fieldwork, and packing in a for performance of fieldwork, g. Active participation in team-	sustainable of distinct performed and articular gies used by a sustainable of distinct performed as used by a sustainable of and satisfact based fieldwoods.	campus farm setting. ormance in different te individual learning sustainable farming campus farm setting. ormance in different sustainable farming campus farm setting. ory performance in ork, and satisfactory			
Course Grade Grade Descriptors	A+ to F A B C	operat Ability assess; object Clear operat Ability asses; Under operat Satisfa differe Knowi perforu Fail to fieldwo	ions. Ability to perform crop mainter to demonstrate solid team-based sment components. Ability to synthe trees for further studies in agriculture understanding of the basics from ions. Ability to perform crop mainter to demonstrate solid team-based sment components. standing of the basics from sustions. Ability to perform crop mainter ions. Ability to perform crop mainter actory demonstration of team-basent assessment components.	nance, har skills for size the le of food and sustainab nance, har skills for tainable f nance, har ad skills to be farmin ponents.	vest, washing, and packing in a performance of fieldwork, and sissons learned during the cours human health. It farming to marketing strategivest, washing, and packing in a performance of fieldwork, and arming to marketing strategie vest, washing, and packing in a for performance of fieldwork, and packing in a for performance of fieldwork, g. Active participation in team-	sustainable of distinct performed and articular gies used by a sustainable of distinct performed as used by a sustainable of and satisfact based fieldwoods.	campus farm setting. ormance in different te individual learning sustainable farming campus farm setting. ormance in different sustainable farming campus farm setting. ory performance in ork, and satisfactory			
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D Fail	operat Ability assess object Clear operat Ability assess Under operat Satisfa differe Knowi perfor Fail to fieldwo	ions. Ability to perform crop mainter to demonstrate solid team-based sment components. Ability to synthe trees for further studies in agriculture understanding of the basics from ions. Ability to perform crop mainter to demonstrate solid team-based sment components. standing of the basics from sustions. Ability to perform crop mainter ions. Ability to perform crop mainter actory demonstration of team-basent assessment components.	nance, har skills for size the le, food and sustainab nance, har skills for tainable f nance, har ed skills to ble farmin ponents.	vest, washing, and packing in a performance of fieldwork, and sissons learned during the cours human health. It farming to marketing strategivest, washing, and packing in a performance of fieldwork, and arming to marketing strategie vest, washing, and packing in a for performance of fieldwork, and packing in a for performance of fieldwork, g. Active participation in team-	sustainable of distinct performed and articular gies used by a sustainable of distinct performed as used by a sustainable of and satisfact based fieldwoods.	campus farm setting. ormance in different te individual learning sustainable farming campus farm setting. ormance in different sustainable farming campus farm setting. ory performance in ork, and satisfactory			
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D Fail	operat Ability assess; object Clear operat Ability asses; Under operat Satisfa differe Knowi perforu Fail to fieldwo	ions. Ability to perform crop mainter to demonstrate solid team-based sment components. Ability to synthe trees for further studies in agriculture understanding of the basics from ions. Ability to perform crop mainter to demonstrate solid team-based sment components. standing of the basics from sustions. Ability to perform crop mainter ions. Ability to perform crop mainter actory demonstration of team-basent assessment components.	nance, har skills for size the le, food and sustainab nance, har skills for tainable f nance, har ed skills to ble farmin ponents.	vest, washing, and packing in a performance of fieldwork, and sissons learned during the cours human health. It farming to marketing strate, vest, washing, and packing in a performance of fieldwork, and arming to marketing strategie vest, washing, and packing in a for performance of fieldwork, and correct of fieldwork, and strategie vest, washing, and packing in a for performance of fieldwork, and strategie vest, washing, and packing in a for performance of fieldwork, and strategie vest, washing and packing in a for performance of fieldwork, and strategie vest, washing and packing in a for performance of fieldwork, and strategie vest, washing and packing in a fine performance of fieldwork, and the performance of fieldwork and the performance of fie	sustainable of distinct performed and articular gies used by a sustainable of distinct performed as used by a sustainable of and satisfact based fieldwoods.	campus farm setting. ormance in different te individual learning sustainable farming campus farm setting. ormance in different sustainable farming campus farm setting. ory performance in ork, and satisfactory assignments and/or No. of Hours			
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D Fail Field cam Activitie	operat Ability assess object Clear operat Ability assess: Under operat Satisfa differe Knowi perform Fail to fieldwo	ions. Ability to perform crop mainter to demonstrate solid team-based sment components. Ability to synthe trees for further studies in agriculture understanding of the basics from ions. Ability to perform crop mainter to demonstrate solid team-based sment components. standing of the basics from sustions. Ability to perform crop mainter ions. Ability to perform crop mainter actory demonstration of team-basent assessment components.	nance, har skills for size the le, food and sustainab nance, har skills for tainable f nance, har ed skills to ble farmin ponents.	vest, washing, and packing in a performance of fieldwork, and sissons learned during the cours human health. It farming to marketing strate, vest, washing, and packing in a performance of fieldwork, and arming to marketing strategie vest, washing, and packing in a for performance of fieldwork, and correct of fieldwork, and strategie vest, washing, and packing in a for performance of fieldwork, and strategie vest, washing, and packing in a for performance of fieldwork, and strategie vest, washing and packing in a for performance of fieldwork, and strategie vest, washing and packing in a for performance of fieldwork, and strategie vest, washing and packing in a fine performance of fieldwork, and the performance of fieldwork and the performance of fie	sustainable of distinct performed and articular gies used by a sustainable of distinct performed as used by a sustainable of and satisfact based fieldwoods.	campus farm setting. ormance in different te individual learning sustainable farming campus farm setting. ormance in different sustainable farming campus farm setting. ory performance in ork, and satisfactory assignments and/or No. of Hours			
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Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D Fail Field cam Activitie Lectures Field wo	operat Ability assess; object Clear operat Ability asses; Under operat Satisfa differe Knowi perfort Fail to fieldwo	ions. Ability to perform crop mainter to demonstrate solid team-based sment components. Ability to synthetives for further studies in agriculture understanding of the basics from ions. Ability to perform crop mainter to demonstrate solid team-based sment components. standing of the basics from sustions. Ability to perform crop mainter actory demonstration of team-based in assessment components. In given the basics of sustainal mance in different assessment components.	nance, har skills for size the le, food and sustainab nance, har skills for tainable f hance, har bed skills for the left of t	vest, washing, and packing in a performance of fieldwork, and sissons learned during the cours human health. It farming to marketing strategivest, washing, and packing in a performance of fieldwork, and arming to marketing strategie vest, washing, and packing in a for performance of fieldwork, and arming to marketing strategie vest, washing, and packing in a for performance of fieldwork, and arming the marketing strategie vest, washing, and packing in a for performance of fieldwork, and the participation in team- emonstrated by unsatisfactory performance of strategies.	sustainable of distinct performed and articular gies used by a sustainable of distinct performed as used by a sustainable of and satisfact based fieldwoods.	campus farm setting. ormance in different te individual learning sustainable farming campus farm setting. ormance in different sustainable farming campus farm setting. ory performance in ork, and satisfactory assignments and/or			
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D Fail Field cam Activitie Lectures Field wo Presenta	operat Ability assess object Clear operat Ability assess: Under operat Satisfa differe Knowi perform Fail to fieldwo	ions. Ability to perform crop mainter to demonstrate solid team-based sment components. Ability to synthetives for further studies in agriculture understanding of the basics from ions. Ability to perform crop mainter to demonstrate solid team-based sment components. standing of the basics from sustions. Ability to perform crop mainter actory demonstration of team-based in assessment components. In given the basics of sustainal mance in different assessment components.	mance, har skills for size the le, food and sustainab nance, har skills for tainable france, hared skills to ble farmin ponents. Det Gro	vest, washing, and packing in a performance of fieldwork, and sissons learned during the cours human health. It farming to marketing strategivest, washing, and packing in a performance of fieldwork, and arming to marketing strategie vest, washing, and packing in a for performance of fieldwork, and arming to marketing strategie vest, washing, and packing in a for performance of fieldwork, and arming the marketing strategie vest, washing, and packing in a for performance of fieldwork, and the participation in team- emonstrated by unsatisfactory performance of strategies.	sustainable of distinct performed and articular gies used by a sustainable of distinct performed as used by a sustainable of and satisfact based fieldwoods.	campus farm setting. ormance in different te individual learning sustainable farming campus farm setting. ormance in different sustainable farming campus farm setting. ormance in different sustainable farming campus farm setting. ory performance in ork, and satisfactory assignments and/or No. of Hours 20 50 10			
Course Grade Grade Descriptors Course Type Course Teaching & Learning Activities Assessment Methods	A+ to F A B C D Fail Field cam Activitie Lectures Field wo Presenta Reading	operat Ability assess object Clear operat Ability assess: Under operat Satisfa differe Knowi perform Fail to fieldwo	ions. Ability to perform crop mainter to demonstrate solid team-based sment components. Ability to synthetives for further studies in agriculture understanding of the basics from ions. Ability to perform crop mainter to demonstrate solid team-based sment components. standing of the basics from sustions. Ability to perform crop mainter actory demonstration of team-based in assessment components. In given the basics of sustainal mance in different assessment components.	mance, har skills for size the le, food and sustainab nance, har skills for tainable france, hared skills to ble farmin ponents. Det Gro	vest, washing, and packing in a performance of fieldwork, and sissons learned during the cours human health. It farming to marketing strategivest, washing, and packing in a performance of fieldwork, and arming to marketing strategit vest, washing, and packing in a for performance of fieldwork, and arming to marketing strategit vest, washing, and packing in a for performance of fieldwork, g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, and g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, and g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, and g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, and g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, and g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, and g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, and g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, and g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, and g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, and g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, and g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork, and g. Active participation in teameromonstrated by unsatisfactory performance of fieldwork performance of fieldwork performance of fieldwork performance of fieldwork performance of fiel	a sustainable of distinct performance in	campus farm setting. ormance in different te individual learning sustainable farming campus farm setting. ormance in different sustainable farming campus farm setting. ory performance in ork, and satisfactory assignments and/or No. of Hours 20 50 10 50			
Course Grade	A+ to F A B C D Fail Field cam Activitie Lectures Field wo Presenta Reading Assessm	operat Ability assess object Clear operat Ability assess object Clear operat Ability assess Under operat Satisfa differe Knowing Perform Fail to fieldworth fieldwo	ions. Ability to perform crop mainter to demonstrate solid team-based sment components. Ability to synthetives for further studies in agriculture understanding of the basics from ions. Ability to perform crop mainter to demonstrate solid team-based sment components. In a standing of the basics from sustions. Ability to perform crop mainter actory demonstration of team-based in assessment components. In given the basics of sustainal mance in different assessment components. In given the basics of sustainable farmers.	mance, har skills for size the le, food and sustainab nance, har skills for tainable france, hared skills to ble farmin ponents. Det Gro	vest, washing, and packing in a performance of fieldwork, and sessons learned during the cours human health. It farming to marketing strategivest, washing, and packing in a performance of fieldwork, and arming to marketing strategie vest, washing, and packing in a for performance of fieldwork, and arming to marketing strategie vest, washing, and packing in a for performance of fieldwork, g. Active participation in teammonstrated by unsatisfactory performance of fieldwork, g. Active participation in teammonstrated by unsatisfactory performance of fieldwork, g. Active participation in teammonstrated by unsatisfactory performance of fieldwork, g. Active participation in teammonstrated by unsatisfactory performance of fieldwork, g. Active participation in teammonstrated by unsatisfactory performance of fieldwork field	a sustainable of distinct performance in	campus farm setting. ormance in different te individual learning sustainable farming campus farm setting. ormance in different sustainable farming campus farm setting. ormance in different sustainable farming campus farm setting. ory performance in ork, and satisfactory assignments and/or No. of Hours 20 50 10 50 30 sment Methods			

Required/recommended reading and online materials	7-10 pages report (not including the references). Please refer to Remarks for format requirements. UBC Faculty of Land and Food Systems will give reading materials to students.
Course Website	http://www.scifac.hku.hk/news/bsc/ubc-summer-course
Additional Course Information	Please note: Students have to cover their own travel costs and course fees charged by the hosting institution (prices to be announced). This course will be offered subject to a minimum enrollment number and availability of teachers. Enrolment of this course is not conducted via the online course selection system. Students will be enrolled manually by the Faculty after approval has been obtained from the course coordinator. This course is taught by staff in UBC and the end of trip report is graded by Dr H S El-Nezami. Students will divided into groups of 3-4. Each group will submit a 7-10 pages report (not including the references). Please use Times New Roman (12 points), single space and 2 cm margins from all sid Remarks: Students will divided into groups of 3-4. Each group will submit a 7-10 pages report (not including the references). Please use Times New Roman (12 points), single space and 2 cm margins from all sides. The report should summarize the group HACCP plan, issues, problems and approaches and suggestions to address any farm related food safety issues. The marking criteria are the scientific quality and clear identification of the issues listed above. In addition each group will be presenting 12-15 minutes on the topic of their report.

		orth East Pacific perspective (6 credits)								
Offering Department	Faculty	Faculty Quota 32								
Course Co-ordinator	Dr T Ve	Dr T Vengatesen, Biological Sciences (rajan@hku.hk)								
Teachers Involved	Prof S k	Dr T Vengatesen, Biological Sciences Prof S Kwok, Faculty of Science Prof G A Williams, Biological Sciences Prof R S S Wu, Biological Sciences								
Course Objectives	marine Ocean, biodiver services	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	abundar change and clir discussor There we the Var coastal habitat. coastal techniqua differe students	s from both HKU and UBC teachers will introduce 'marine nce and distribution of species, productivity, coastal poll. The course will also introduce the commercial aspects mate change mitigation through management of coastal ed through a series of field observations, presentations frow ill be an excellent opportunity to touch and learn about Concouver Aquarium, and northern Vancouver Fish Hatcher plankton biodiversity through vising the Marina (Resonable There will also be several opportunities to explore the habitats, sandy beaches and estuaries in the Vancouver and methods of studying marine life in the field will be ent learning environment involving not only HKU teachers, bringing diverse range of expertise, cultures, and learn Ocean to focus on the diversity, dynamic interactions and to	ution, fisheries, aqua- of marine life, i.e. eel ecosystems. All the m guest lecturers and anada's wonderful ma- ery. Students will be eed point marina) a intertidal zone, expo- uver Island. Marine emphasized. Studenti- and students but also ning opportunities fror	culture and climate- grass, aquaculture se lectures will be group discussions trine life diversity in learning Canada' and the Sea-grasused and protecte-biodiversity survest will be exposed to UBC teachers and climate and the sea-grasused and protecte-biodiversity survest will be exposed to UBC teachers and climate a						
Course Learning Outcomes	On successful completion of this course, students should be able to:									
	CLO 1 understand the basics of marine life science and the marine habitable planet									
	CLO 2 explain the major types, causes, and effects of marine threats such as pollution, overfishing, global warming and ocean acidification, and invasive species, as well as describe the consequences of these threats for marine communities and ecosystem services									
	CLO 3	CLO 3 describe the difference between coastal marine biodiversity and harbors in Hong Kong and Canada								
	CLO 4 discover the reasons why marine biodiversity and ecosystem services in Hong Kong are so different from the North Pacific coastal ecosystems									
Pre-requisites (and Co-requisites and Impermissible combinations)		s are expected to have passed at least 30 credits of s will need to pass an interview in order to be enrolled in the		2 science courses						
Offer in 2015 - 2016	Y S	Y Summer Examination Summer								
Offer in 2016 - 2017	Υ		'							
Course Grade	A+ to F									
Grade Descriptors	A Demonstrate through knowledge in basics of marine science and clearly understand why and how coastal biodiversity in sub-tropical Hong Kong is different from the North Pacific coastal areas. Ability to explain how marine organisms have adapted to their particular environments. Showing strong abilities, and logical thinking, with evidence of original thought, to examine reasons why the diversity of marine life and their habitats are so important to human society. Independent critique on how human induced threats such as climate change, pollution and habitat change will affect marine life, its diversity and their ecosystem services.									

	pa	rticular environments. Knowing the commo e so important to human society. Knowing	particular environments. Knowing the common views on the reasons why the diversity of marine life are so important to human society. Knowing the common views on how human induced threat change, pollution and habitat change will affect marine life, its diversity and their ecosystem service						
	bio the ha	Demonstrate partial and limited command of knowledge and understanding of the basics biodiversity and coastal ecosystem services. Develop little ability to explain how marine organitheir particular environments. Knowing the common views on the reasons why the diversity of habitats are so important to human society. Knowing the common views on how human ind climate change, pollution and habitat change will affect marine life, its diversity and their ecosyst							
		nowing some of the basics of marine science ir particular environments.	ganisms have adapted to						
		il to follow the basics of marine scien vironments.	ce and/or how marine organ	isms have ad	apted to their particular				
Course Type	Field camps								
Course Teaching & Learning Activities	Activities		Details		No. of Hours				
a Learning Activities	Lectures		10 sessions x 2.5 hours	S	25				
	Field work		Field observation a about 5 to 6 field study	36					
	Presentation		Group discussion / group project with pres	10					
	Reading / Sel	f study			70				
Assessment Methods and Weighting	Methods	Details	Weighting in fina course grade (%		sessment Methods to CLO Mapping				
	Assignments	Group project work (30-resentation)	mins 25		CLO 2				
	Report	2-hour written examination	50		CLO 1,4				
	Test	Field observation (group active & reports)	vities 25 CLO 3,4						
Required/recommended reading and online materials	Reference rea	ding materials will be put on Mood	e.						
Course Website	http://www.scit	ac.hku.hk/news/bsc/ubc-summer-o	course						
Additional Course Information	institution (price This course win Enrolment of the course wind the course with the course win	Students have to cover their ow es to be announced). Il be offered subject to a minimum his course is not conducted via the e Faculty after approval has been	enrollment number and a	vailability of system. Stu	teachers. dents will be enrolled				

SCNC3111 Frontiers of sci	ience ho	nours seminar course (6 credits)	Academic Year	2015						
Offering Department	Faculty Quota 30									
Course Co-ordinator	Prof P (Chiu, Chemistry (pchiu@hku.hk)								
Teachers Involved	Dr R K V Dr B C V Dr G W	M Leung & Dr E J Pickett, Faculty of Science W Lui, Faculty of Science H Ng, Faculty of Science Porter, Faculty of Science Wotherspoon, Faculty of Science								
Course Objectives	To broat To foste To obsidiscove To enha society To colla To deve	duce the research being done by our Faculty's star p den and enrich students' scientific knowledge in and ir intellectual discussions between our research profe- erve how research is done and note the thinking ries ance students' awareness of the importance of scie- borate with and learn from peers from different acad- lop essential written and spoken communication skiller as a potential mentor-mentee matching platform fo	outside of their chosen major essors and students in a sma g processes and paths that ence to solve some of the pr emic backgrounds in a scient is	Il group setting lead to scienti oblems facing the ific setting						
Course Contents & Topics										
Course Learning Outcomes	On succ	essful completion of this course, students should be	able to:							
	CLO 1 describe and discuss in an informed manner the fields of research of some of our resprofessors									
	CLO 2 identify how professors with different scientific training solve their research problems									
	CLO 3 apply literature search skills to identify and develop a research topic									
	CLO 4 practice and master scientific writing and presentation skills									

	CLO 5 demonstrate interpersonal skills in collaborating with their peers in a scientific setting									
	CLO 6 de	CLO 6 devise a research proposal and evaluate their peers' works								
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in SCNC1111, SCNC1112 and a level 2 science course. Students who participated or will participate in ORF/SRF must take this course.								
Offer in 2015 - 2016	Y 2nd	sem			Exa	amination	No Exam			
Offer in 2016 - 2017	Y									
Course Grade	A+ to F									
Grade Descriptors	Α	outcom	strate thorough mastery of extensive es. Show strong analytical and critical of familiar and unfamiliar situations. Ap	al abilities	s and logical thinking, a	and ability to	apply knowledge to a wide			
	В	course	strate substantial command of a broad learning outcomes. Show evidence o dge to familiar and some unfamiliar sit	f analytic	cal and critical abilities	and logical	hinking, and ability to apply			
	С	learning	strate general but incomplete comming outcomes. Show evidence of some dge to most familiar situations. Apply r	analytica	al and critical abilities a	and logical t	hinking, and ability to apply			
	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 are 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	sed cou	ırse							
Course Teaching	Activities	i		Deta	ils	No. of Hours				
& Learning Activities	Lectures						36			
	Tutorials						12			
	Reading /	Self stu	ıdy				100			
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		Assessment Methods to CLO Mapping			
	Assignme	nts	A series of writing and reflection assignments will be given		40		CLO 1,2,4			
	Presentati	ion	Students will give a 30-minute group presentation during the last week of the instruction				CLO 3,4,5,6			
	Project re	ports	In-class formative assess activities for students to we groups		:	20	CLO 1,2,4,5			
Required/recommended reading and online materials	TBC (sugg	ested b	y the professors)	1		'				

STAT1600 Statistics: ideas	and conce	epts (6	credits)			Academic Y	ear	2015	
Offering Department	Statistics & Actuarial Science					Quota			
Course Co-ordinator	Dr K P Wa	Dr K P Wat, Statistics & Actuarial Science (watkp@hku.hk)							
Teachers Involved	Dr Y K Chu	Dr K P Wat, Statistics & Actuarial Science Dr Y K Chung, Statistics & Actuarial Science Prof W K Li, Statistics & Actuarial Science							
Course Objectives	Risk Mana spectrum	gemen of disc	at providing a broad overview of t. It focuses on the roles of s plines, and as a science of s a panoramic foundation for a f	tatisti reasoi	cs as a scientif ning which has	ic tool with revolutionize	applicated mod	ions to ern int	a wide
Course Contents & Topics	Data presProbabilitInference	 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 Outcomes	On succes	sful cor	npletion of this course, students	shou	ld be able to:				
	CLO 1 ur	ndersta	nd the role of statistics as a tool	for so	cientific reasoning	g			
	CLO 2 pr	esent c	lata in a useful and informative	way					
	CLO 3 ac	quire b	asic concepts and perspectives	of sta	atistical modelling	g and inferen	ce		
	CLO 4 di	stinguis	h between good and bad statist	tical p	ractices				
	CLO 5 pu		major study in Statistics or			vith a well-es	stablish	ed con	nceptual
Pre-requisites (and Co-requisites and Impermissible combinations)	NIL								
Offer in 2015 - 2016	Y 1st s	sem 2	nd sem			Examination	1	Dec	May
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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 course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability to ap knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.							y to apply	
	C Demonstrate general but incomplete command of knowledge and learning outcomes. Show evidence of some analytical and critical knowledge to most familiar situations. Apply moderately effective or					es and logical th	ninking, a	nd ability	
	D	outcom	nes. Show evidence of some coherent a	ınd logi	owledge and skills required for attaining some of the course learning dilugical thinking, but with limited analytical and critical abilities. Sho problems. Apply limited or barely effective organizational ar				ies. Show
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course learn outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to ap knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.								
Course Type	Lecture-ba	sed cou	ırse						
Course Teaching	Activities			Deta	ils			No. of	f Hours
& Learning Activities	Lectures								36
	Tutorials								12
	Reading /	Self stu	udy						100
Assessment Methods and Weighting	Methods		Details		Weighting in fi		\ssessr		lethods lapping
	Assignments		Coursework (assignments, cl test(s) and project(s))	ass	s .		CLO 1,		
	Examinati	on	One 2-hour written examinatio	n		40	CLO 1,	2,3,4,5	
Required/recommended reading and online materials	Heckard, R Albright, S Excel. Cen	Utts, J.M. (2014). Seeing Through Statistics (4th edition). Cengage Learning. Heckard, R.F. and Utts, J.M. (2012). Statistics (International edition, 4th edition). Cengage Learning. Albright, S. C., Winston, W. L. and Zappe, C. J. (2009). Data Analysis and Decision Making with Microso Excel. Cengage Learning.							
	Woore. D. R	Moore, D. S. and Notz, W. I. (2006). Statistics: Concepts and Controversies. Freeman: New York.							

STAT1601 Elementary stati	Academic Year	2015				
Offering Department	Offering Department Statistics & Actuarial Science					
Course Co-ordinator	Course Co-ordinator Mrs G M Jing, Statistics & Actuarial Science (gmjing@saas.hku.hk)					

Teachers Involved	Mrs G M Ji	ng, Sta	tistics & Actuarial Science						
Course Objectives	Research findings are usually supported by data. Data collected in an experiment/survey are often concerned with situations involving variability and uncertainty. They are used to estimate the true value of a certain quantity or to test the acceptability of a certain new hypothesis. Valid methods of analysing the data are thus essential to any successful investigation. The course aims to present the fundamentals of statistical methods widely used by researchers. Microsoft Excel might be used to carry out some statistical analysis. There is no demand of sophisticated technical mathematics.								
Course Contents & Topics	Presentation Probability Geometric Theorem,	The course will introduce and study the following topics: Presentation of data, Measures of Central Tendency, Measures of Variability and Uncertainty, Basis Probability Laws, Common Probability Distributions such as Uniform, Binomial, Poisson, Hyper-geometric Geometric and Normal distributions, Random Sampling, Distribution of the Mean, Normal Sampling Theorem, Point Estimation, Confidence Intervals, Sample Size Determination, Hypothesis Testing Inferences for Mean and Proportion, Chi-squared tests, Simple Regression and Correlation							
Course Learning Outcomes	On success	successful completion of this course, students should be able to:							
	CLO 1 se	lect an	d use appropriate statistical me	thods	to analyze data				
	CLO 2 pe	rform s	tatistical analysis with calculato	r and	Microsoft Excel				
	CLO 3 un	derstar	nd and apply basic concepts of	proba	ability				
	CLO 4 ga	in fami	liarity with the fundamental con-	cepts	of random variables				
	CLO 5 ma	ake infe	erences on a population based of	on sa	mple data				
	CLO 6 de	termine	e the most appropriate statistica	l met	hod to use for a given	statistical p	oroblem		
			ropriate conclusions based on t						
			nd the basic principles of simple al problems	e line	ar regression and corr	elation an	d their applications		
Pre-requisites (and Co-requisites and Impermissible combinations)	Not for stud Not for stu Probability	dents wudents and s	n HKDSE Mathematics or equivith Level 2 or above in HKDSE who have passed or already tatistics: foundations of actuatistics I, STAT1603 Introductory	Math enr rial s	ematics Extended Mod olled in any of the fo cience, STAT1602 Bo	ollowing o	ourses: STAT2901 atistics, STAT2601		
Offer in 2015 - 2016	Y 2nd	sem			Exam	ination	May		
Offer in 2016 - 2017	Υ				·		·		
Course Grade	A+ to F								
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of origin thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply high effective organizational and presentational skills.						ith evidence of original		
	B Demonstrate substantial command of a broad range of knowledge an course learning outcomes. Show evidence of analytical and critical a knowledge to familiar and some unfamiliar situations. Apply effective or					logical think	ing, and ability to apply		
	learning outcomes. Show evidence of so				mand of knowledge and skills required for attaining most of the course me analytical and critical abilities and logical thinking, and ability to apply y moderately effective organizational and presentational skills.				
	D	outcom limited	es. Show evidence of some coherent a	ed command of knowledge and skills required for attaining some of the course learnir f some coherent and logical thinking, but with limited analytical and critical abilities. Sho owledge to solve problems. Apply limited or barely effective organizational ar					
	outcomes. Lack of analytical and critical abil				mand of knowledge and skills required for attaining the course learnin bilities, logical and coherent thinking. Show very little or no ability to app and presentational skills are minimally effective or ineffective.				
Course Type	Lecture-bas	sed cou	ırse						
Course Teaching & Learning Activities	Activities			Deta	ails		No. of Hours		
	Lectures						36		
	Tutorials						12		
	Reading /	Self stu	ıdy				100		
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)	Ass	essment Methods to CLO Mapping		
	Assignme	nts	Coursework (assignme tutorials, and a class test)	nts,	25	CLC	0 1,2,3,4,5,6		
	Examination	on	One 2-hour written examinatio	n	75	CLO ²	1,2,3,4,5,6,7,8		
Required/recommended reading and online materials	Larson, R. Berk, K.N.	& Farbe & Care	Statistics (Pearson (Asia), 2007 er, B.: Elementary Statistics, Pic y, P.: Data Analysis with Micros rles, B. M.: Statistics - A First C	cturing oft E	KCEL (Duxbury press,	Update Of			
Course Website	moodle.hku	ı.hk							
Additional Course Information		moodle.nku.nk Calculator: CASIO fx-50FH (This model has SD-MODE, REG-MODE, nCr and Normal Probability Function which is very suitable for this course.)							

Offering Department	Statistics	s & Actua	rial Science		Quota	
Course Co-ordinator	Dr R W	L Wong, S	Statistics & Actuarial Science (rwo	ong @hku.hk)		
Teachers Involved	_		Statistics & Actuarial Science	3 - " /		
Course Objectives	The disc greatly a tool. Th standard statistica	cipline of affects the is elemed situation	statistics is concerned with sitt e interpretation of data. Thus s ntary course, which is taught ns of data analysis and interp of these situations are presented	tatistics forms an in without much techn retation with emph	mportant description nical mathematics ases on business	ve and analytica , presents man s examples. Th
Course Contents & Topics	Tendend Distribut Normal Hypothe	cy, Measi ions such Sampling sis Testir	ntroduce and discuss the follow ures of Variability and Uncertain as Binomial, Normal, Poisson, F Theorem, Point Estimation, C ag involving Inferences for Means Correlation, Elementary Time Serie	ty, Elementary Prob Hyper-geometric and confidence Intervals and Proportions as	pability Rules and Geometric, Rando and Sample Siz well as the Chi-squ	Basic Probabilition Sampling, the Determination
Course Learning Outcomes	On succ	essful co	mpletion of this course, students s	should be able to:		
	CLO 1	understa	nd the methods for describing set	s of data		
	CLO 2		statistical analysis with calculator al summaries	and Microsoft Excel	, draw conclusions	from data using
	CLO 3	understa	nd and apply basic concepts of p	robability		
	CLO 4	gain fam	iliarity with the fundamental conce	epts of random varial	bles	
	CLO 5	make inf	erences on a population based or	sample data		
			e the most appropriate statistical		•	
	CLO 7	gain fam problems	iliarity with the fundamental concess	epts of statistical infe	erence as they app	oly to a variety of
	CLO 8		nd the basic principles of simple cal problems in today's society	linear regression an	d correlation and t	heir applications
Offer in 2015 - 2016	data (This co		ibility and statistics: foundations clusive for School of Business stu		, ECON1280 Anai	ysis of econom
					Examination	Dec May
Offer in 2016 - 2017	Υ				Examination	Dec May
	Y A+ to F				Examination	Dec May
Course Grade	A+ to F	course though effecti	nstrate thorough mastery at an advanced learning outcomes. Show strong analyti nt, and ability to apply knowledge to a wi ve organizational and presentational skills	cal and critical abilities and call and critical abilities and complex, fand.	edge and skills require nd logical thinking, with niliar and unfamiliar situ	d for attaining all the evidence of origina uations. Apply highl
Offer in 2016 - 2017 Course Grade Grade Descriptors	A+ to F A B	course though effecti Demo course knowle	nstrate thorough mastery at an advanced be learning outcomes. Show strong analyting, and ability to apply knowledge to a wive organizational and presentational skills instrate substantial command of a broad replearning outcomes. Show evidence of a adge to familiar and some unfamiliar situat	cal and critical abilities and de range of complex, far unge of knowledge and sk nalytical and critical abilitions. Apply effective organizations.	edge and skills require nd logical thinking, with niliar and unfamiliar situ ills required for attaining ies and logical thinking nizational and presenta	d for attaining all the evidence of origina uations. Apply highly g at least most of the , and ability to applytional skills.
Course Grade	A+ to F	course though effecti Demo course knowle Demo learnir	nstrate thorough mastery at an advanced elearning outcomes. Show strong analytint, and ability to apply knowledge to a wive organizational and presentational skills nstrate substantial command of a broad rate learning outcomes. Show evidence of a	cal and critical abilities and range of complex, fander and selection and critical abilitions. Apply effective orgation of knowledge and skills and critical abilitions. Apply effective orgation and critical abilitical abilitical and critical abilitical abilitical abilitical abilitical abilitic	edge and skills requirer do logical thinking, with niliar and unfamiliar situils required for attaining its and logical thinking nizational and presents required for attaining es and logical thinking es and logical thinking	d for attaining all the evidence of origina uations. Apply highly g at least most of the, and ability to apply tional skills. most of the course, and ability to apply
Course Grade	A+ to F A B	course though effecting the course knowled bemoon learning knowled bemoon outcor limited	nstrate thorough mastery at an advanced learning outcomes. Show strong analytint, and ability to apply knowledge to a wive organizational and presentational skills instrate substantial command of a broad relearning outcomes. Show evidence of a edge to familiar and some unfamiliar situat instrate general but incomplete commanding outcomes. Show evidence of some and outcomes. Show evidence of some and	cal and critical abilities at de range of complex, far inge of knowledge and sk nalytical and critical abilitions. Apply effective orga d of knowledge and skills alytical and critical abilitical derately effective organizations.	edge and skills requirend logical thinking, with niliar and unfamiliar situills required for attainingies and logical thinking nizational and presentational ead logical thinking ational and presentational ed for attaining some ollimited analytical and ollimited analytical and ollimited analytical and ollimited analytical and	d for attaining all the evidence of origina uations. Apply highly g at least most of the, and ability to apply tional skills. most of the course, and ability to apply all skills. If the course learning tritical abilities. Show
Course Grade	A+ to F A B	course though effecting the course course knowle personal	instrate thorough mastery at an advanced a learning outcomes. Show strong analytint, and ability to apply knowledge to a wive organizational and presentational skills instrate substantial command of a broad rate learning outcomes. Show evidence of a ledge to familiar and some unfamiliar situationstrate general but incomplete commanding outcomes. Show evidence of some an edge to most familiar situations. Apply more most and a show evidence of some coherent and a ability to apply knowledge to solve	cal and critical abilities at de range of complex, fan ange of knowledge and sk nalytical and critical abilitions. Apply effective orga d of knowledge and skills lalytical and critical abilitiderately effective organization by b	edge and skills requirer nd logical thinking, with niliar and unfamiliar situ iills required for attaining ies and logical thinking nizational and presenta s required for attaining es and logical thinking ational and presentation ed for attaining some o limited analytical and o d or barely effective s required for attaining inking. Show very little	d for attaining all the evidence of origina uations. Apply highly g at least most of the, and ability to apply tional skills. most of the course, and ability to apply all skills. If the course learning ritical abilities. Show organizational and the course learning or no ability to apply or no ability to apply
Course Grade Grade Descriptors	A+ to F A B C D	course though effecting the course course knowle personal	instrate thorough mastery at an advanced be learning outcomes. Show strong analytint, and ability to apply knowledge to a wive organizational and presentational skills instrate substantial command of a broad rate learning outcomes. Show evidence of a ledge to familiar and some unfamiliar situat instrate general but incomplete command goutcomes. Show evidence of some aredge to most familiar situations. Apply mostrate partial but limited command of known in the partial but limited command in the partial but limited and critical abilities added to solve problems. Organization and	cal and critical abilities at de range of complex, fan ange of knowledge and sk nalytical and critical abilitions. Apply effective orga d of knowledge and skills lalytical and critical abilitiderately effective organization by b	edge and skills requirer nd logical thinking, with niliar and unfamiliar situ iills required for attaining ies and logical thinking nizational and presenta s required for attaining es and logical thinking ational and presentation ed for attaining some o limited analytical and o d or barely effective s required for attaining inking. Show very little	d for attaining all the evidence of original uations. Apply highly g at least most of the, and ability to apply tional skills. most of the course, and ability to apply al skills. If the course learning ritical abilities. Show organizational and the course learning or no ability to apply or no ability to apply
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D	course though effective period outcorn in the course knowle period perio	Instrate thorough mastery at an advanced be learning outcomes. Show strong analytint, and ability to apply knowledge to a wive organizational and presentational skills instrate substantial command of a broad rate learning outcomes. Show evidence of a edge to familiar and some unfamiliar situat instrate general but incomplete commanding outcomes. Show evidence of some an edge to most familiar situations. Apply more instrate partial but limited command of knowns show evidence of some coherent and lability to apply knowledge to solve intational skills. Instrate little or no evidence of commandines. Lack of analytical and critical abilities edge to solve problems. Organization and urse	cal and critical abilities at de range of complex, fan ange of knowledge and sk nalytical and critical abilitions. Apply effective orga d of knowledge and skills lalytical and critical abilitiderately effective organization by b	edge and skills requirer nd logical thinking, with niliar and unfamiliar situ iills required for attaining ies and logical thinking nizational and presenta s required for attaining es and logical thinking ational and presentation ed for attaining some o limited analytical and o d or barely effective s required for attaining inking. Show very little	d for attaining all the evidence of origina uations. Apply highly g at least most of the, and ability to apply tional skills. most of the course, and ability to apply all skills. If the course learning ritical abilities. Show organizational and the course learning or no ability to apply or no ability to apply
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D Fail	course though effective for the course knowle for the course knowle for the course knowle for the course knowle for the course	Instrate thorough mastery at an advanced be learning outcomes. Show strong analytint, and ability to apply knowledge to a wive organizational and presentational skills instrate substantial command of a broad rate learning outcomes. Show evidence of a edge to familiar and some unfamiliar situat instrate general but incomplete commanding outcomes. Show evidence of some an edge to most familiar situations. Apply more instrate partial but limited command of knowns show evidence of some coherent and lability to apply knowledge to solve intational skills. Instrate little or no evidence of commandines. Lack of analytical and critical abilities edge to solve problems. Organization and urse	cal and critical abilities at de range of complex, fan ange of knowledge and skinalytical and critical abilitions. Apply effective orgat of knowledge and skills alytical and critical abilitiderately effective organization of the complex of the co	edge and skills requirer nd logical thinking, with niliar and unfamiliar situ iills required for attaining ies and logical thinking nizational and presenta s required for attaining es and logical thinking ational and presentation ed for attaining some o limited analytical and o d or barely effective s required for attaining inking. Show very little	d for attaining all the evidence of origina uations. Apply highly g at least most of the, and ability to apply titional skills. most of the course, and ability to apply al skills. If the course learning or no ability to apply altered abilities.
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D Fail Lecture- Activiti	course though effective through effective through effective through effective through effective through earning through earning through effective through ef	Instrate thorough mastery at an advanced be learning outcomes. Show strong analytint, and ability to apply knowledge to a wive organizational and presentational skills instrate substantial command of a broad rate learning outcomes. Show evidence of a edge to familiar and some unfamiliar situat instrate general but incomplete commanding outcomes. Show evidence of some an edge to most familiar situations. Apply more instrate partial but limited command of knowns show evidence of some coherent and lability to apply knowledge to solve intational skills. Instrate little or no evidence of commandines. Lack of analytical and critical abilities edge to solve problems. Organization and urse	cal and critical abilities at de range of complex, fan ange of knowledge and skinalytical and critical abilitions. Apply effective orgat of knowledge and skills alytical and critical abilitiderately effective organization of the complex of the co	edge and skills requirer nd logical thinking, with niliar and unfamiliar situ iills required for attaining ies and logical thinking nizational and presenta s required for attaining es and logical thinking ational and presentation ed for attaining some o limited analytical and o d or barely effective s required for attaining inking. Show very little	d for attaining all the evidence of origina uations. Apply highly g at least most of the, and ability to apply tional skills. most of the course, and ability to apply all skills. If the course learning tritical abilities. Show organizational and the course learning or no ability to apply effective. No. of Hours
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D Fail Lecture- Activiti Lecture Tutorial	course though effective through effective through effective through effective through effective through earning through earning through effective through ef	Instrate thorough mastery at an advanced be learning outcomes. Show strong analytint, and ability to apply knowledge to a wive organizational and presentational skills nstrate substantial command of a broad rate learning outcomes. Show evidence of a ledge to familiar and some unfamiliar situationstrate general but incomplete commanding outcomes. Show evidence of some arredge to most familiar situations. Apply more strate partial but limited command of knownstrate partial but limited command of knownstrate partial but limited command of some coherent and ability to apply knowledge to solve trational skills. Instrate little or no evidence of commandines. Lack of analytical and critical abilities edge to solve problems. Organization and turse	cal and critical abilities at de range of complex, fan ange of knowledge and skinalytical and critical abilitions. Apply effective orgat of knowledge and skills alytical and critical abilitiderately effective organization of the complex of the co	edge and skills requirer nd logical thinking, with niliar and unfamiliar situ iills required for attaining ies and logical thinking nizational and presenta s required for attaining es and logical thinking ational and presentation ed for attaining some o limited analytical and o d or barely effective s required for attaining inking. Show very little	d for attaining all the evidence of original pations. Apply highly g at least most of the and ability to apply tional skills. most of the course, and ability to apply all skills. f the course learning or no ability to apply or no ability to apply effective. No. of Hours 36
Course Grade Grade Descriptors Course Type Course Teaching & Learning Activities	A+ to F A B C D Fail Lecture- Activiti Lecture Tutorial	course though effective person outcor limited present based course knowle present person outcor limited present person outcor knowle pe	Instrate thorough mastery at an advanced be learning outcomes. Show strong analytint, and ability to apply knowledge to a wive organizational and presentational skills nstrate substantial command of a broad rate learning outcomes. Show evidence of a ledge to familiar and some unfamiliar situationstrate general but incomplete commanding outcomes. Show evidence of some arredge to most familiar situations. Apply more strate partial but limited command of knownstrate partial but limited command of knownstrate partial but limited command of some coherent and ability to apply knowledge to solve trational skills. Instrate little or no evidence of commandines. Lack of analytical and critical abilities edge to solve problems. Organization and turse	cal and critical abilities at de range of complex, fan ange of knowledge and skinalytical and critical abilitions. Apply effective orgat of knowledge and skills alytical and critical abilitiderately effective organization of the complex of the co	edge and skills required logical thinking, with niliar and unfamiliar situills required for attaining less and logical thinking nizational and presentation es and logical thinking ational and presentation ed for attaining some of limited analytical and of or barely effective as required for attaining inking. Show very little ninimally effective or ine	d for attaining all the evidence of origina uations. Apply highly g at least most of the, and ability to apply tional skills. most of the course, and ability to apply all skills. If the course learning or no ability to apply or no ability to apply effective. No. of Hours 36 12 100 sment Methods
Course Grade	A+ to F A B C D Fail Lecture- Activiti Lecture Tutorial Reading	course though effective	Instrate thorough mastery at an advanced be learning outcomes. Show strong analytic at, and ability to apply knowledge to a wive organizational and presentational skills instrate substantial command of a broad rate learning outcomes. Show evidence of a adge to familiar and some unfamiliar situationstrate general but incomplete command goutcomes. Show evidence of some andege to most familiar situations. Apply monstrate partial but limited command of known and the partial but limited command of known and the partial but limited command of known and the partial but limited command the partial but limited command of known and the partial but limited command of known and the partial but limited command skills. Instrate little or no evidence of command ness. Lack of analytical and critical abilities adge to solve problems. Organization and the partial par	cal and critical abilities at de range of complex, fan	edge and skills required to logical thinking, with niliar and unfamiliar situills required for attaining ies and logical thinking nizational and presentation es required for attaining es and logical thinking attonal and presentation ed for attaining some of limited analytical and of or barely effective is required for attaining some of limited analytical and of or barely effective or institution in the second se	d for attaining all the evidence of origina uations. Apply highly g at least most of the, and ability to apply tional skills. most of the course, and ability to apply all skills. If the course learning or included abilities. Show organizational and the course learning or no ability to apply affective. No. of Hours

Required/recommended reading and online materials	Berk, K.N. & Carey, P.: Data Analysis with Microsoft EXCEL (Duxbury press, Update Office 2007) Bowerman, B.L. & O'Connell, E.S.: Business Statistics in Practice (McGraw-Hill International Edition, 2008, 5th ed.)	
Course Website	moodle.hku.hk	

STAT1603 Introductory sta	tistics (6 c	redits			Acad	demic Year	2015	
Offering Department	Statistics 8	& Actua	rial Science		Quo	ta		
Course Co-ordinator	Dr E K F L	am, Sta	tistics & Actuarial Science (hrnt	tlkf@	hku.hk)			
Teachers Involved	Dr E K F L	am, Sta	tistics & Actuarial Science					
Course Objectives	interpretat statistics for mathemat	ion of o orms an ical bac	f statistics is concerned with data needs special techniques important descriptive and analy kground will find this course su s to be presented with economy	whe tical uitabl	n variability plays a tool of many scientifice, because the language	role, as it usu disciplines. C	ally does. Thus andidates with a	
Course Contents & Topics	Basic Pro Samples,	bability Point E	ata, Variability and Uncertainty, Theory and Techniques, Rai stimation, Normal Sampling The and Correlation.	ndom	Variables and Prob	oability Distrib	utions, Random	
Course Learning Outcomes	On succes	ssful cor	npletion of this course, students	sho	uld be able to:			
	01.0.4		P## 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					
		CLO 1 compute different measures of central tendency and dispersion						
			e of the basic probability theory			•		
		now how ne popu	v to construct confidence intervation	als a	nd use hypotheses te	sting to carry o	out inference on	
			r regression and correlation menvironment	etho	ds to solve problems	in science an	d in social and	
Pre-requisites (and Co-requisites and Impermissible combinations)	(Pass in M Not for stu STAT1601	1ATH10 Idents w 1 Eleme	in HKDSE Mathematics Extend 11 University mathematics I, or ho have passed or already enro entary statistical methods, STA 901 Probability and statistics: for	alrea olled AT16	dy enrolled in this cou in any of these course 02 Business statistic	rse); and s: s, STAT2601	Probability and	
Offer in 2015 - 2016	Y 1st	sem			Exar	mination	Dec	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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 m course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and ability knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills.					and ability to apply	
	С	Demonstrate general but incomplete command of knowledge and skills required for a learning outcomes. Show evidence of some analytical and critical abilities and logical the knowledge to most familiar situations. Apply moderately effective organizational and present the common of th					thinking, and ability to apply	
	D	outcon limited	nes. Show evidence of some coherent a	ical thinking, but with limite	required for attaining some of the course learning ut with limited analytical and critical abilities. Show limited or barely effective organizational and			
	Fail	Demonstrate little or no evidence of command of knowledge and skills required for at outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show ve knowledge to solve problems. Organization and presentational skills are minimally effective				Show very little of	very little or no ability to apply	
Course Type	Lecture-ba	ased co	ırse					
Course Teaching	Activities	S		Details			No. of Hours	
& Learning Activities	Lectures						36	
	Tutorials						12	
	Reading /	/ Self stu	ıdy				100	
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		ment Methods CLO Mapping	
	Assignme	ents	Coursework (assignme tutorials, and a class test)	nts,	25	CLC	1,2,3	
	Examinat	ion	One 2-hour written examination	n	75	CLO	1,2,3,4	
Required/recommended reading and online materials	Jersey, 20 Larson, R Bluman, A 5th edition	004, 7th . and Fa G.: El n)	rber, B.: Elementary Statistics - ementary Statistics - A Step by	Pictu Step	ring the World (Prenti Approach (The McGr	ce Hall, 2006, aw-Hill Compa	3rd edition)	
	Triola, M.	⊢.: Elem	entary Statistics (Addiso Wesle	y Lor	ngman, Inc., 1998, 7th	edition)		

Additional Course Information	Students who intend to major in "Risk Management" or "Statistics" should take STAT2601 instead of this
	course.
	Other references:
	Wonnacott, T. H. and Wonnacott, R. J.: Introductory Statistics (Wiley, New York, 1972, 2nd edition)
	Dixon, W. J. and Massey, Jr, F. J.: Introduction to Statistical Analysis (McGraw Hill, 1983, 4th edition)

Acade	emic Year	2015				
Quota	a					
.hk)						
nich uncertainty and tool in many pra elevant probability i	ractical probl	ems. Against a				
nd probability law ribution function (co lons; Continuous ra Exponential, Gamr al distributions; Ind sted value; Varian	edf); Probabili random varial nma, and norr dependent ra	ty mass function oles; Cumulative mal distributions undom variables				
e able to:						
neory						
calculations						
ulus and linear alg ts admitted in 2014 enrolled in this cou ions and MATH185 y statistics, or alrea and statistics: four	4 or thereafte urse, for stud 853 Linear alg ady enrolled i	r; or ents admitted in gebra, probability in this course;				
Exami	ination	Dec May				
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.						
nd skills required for attainking, but with limited a . Apply limited or ba	analytical and cri	itical abilities. Show				
edge and skills required and coherent thinking. Sl anal skills are minimally	Show very little o	r no ability to apply				
		No. of Hours				
		36				
		12				
		100				
ighting in final		ment Methods				
urse grade (%)		1,2,3				
	75					

Required/recommended reading and online materials	DeGroot, M.H. and Schervish, M.J.: Probability and Statistics (Boston: Addison-Wesley, 2012, 4th ed.) Sheldon, R.: A First Course in Probability (Upper Saddle River: Prentice Hall, 2010, 8th ed.) Miller, I. and Miller, M.: John E. Freund's Mathematical Statistics with Applications (Upper Saddle River: Prentice Hall, 2004, 7th ed.) Hogg, R.V., McKean J.W., and Craig, A.T.: Introduction to Mathematical Statistics (Upper Saddle River: Prentice Hall, 2013, 7th ed.) Hogg, R. V. & Tanis E. A.: Probability and Statistical Inference (Upper Saddle River: Prentice Hall, 2010, 8th ed.)
Course Website	moodle.hku.hk

STAT2602 Probability and	statistics II	(6 cre	edits)		Δ	cademic Year	2015
Offering Department	Statistics &	Actuar	ial Science		C	luota	
Course Co-ordinator	Dr E K F La	am, Sta	tistics & Actuarial Science (hrntl	lkf@h	nku.hk)		·
Teachers Involved			atistics & Actuarial Science tistics & Actuarial Science				
Course Objectives	on the two statistical m	major a nodellin	s on STAT2601, introducing furt areas of statistical analysis: estir g, inference and decision makin reeptions essential for making rig	matio ng, st	n and hypothesis tudents will be eq	testing. Through uipped with both	n the disciplines o quantitative skills
Course Contents & Topics	theory: laws 2. Estimati Cramer-Ra 3. Hypothe Neyman-Pe	s of largion: es lo Lowe esis tes earson nce inte	om sample; sampling distribution ge numbers and Central Limit The timator; bias; mean squared er Bound; efficiency; method of n sting: types of hypotheses; tes Lemma; generalized likelihood r erval: confidence level; confide	neore error; nome st sta ratio t	em; likelihood; suff ; standard error; ents; maximum like atistics; p-value; est; Pearson chi-s	iciency; factorisa consistency; F elihood estimator size; power; like squared test; Wa	tion criterion; isher information ; elihood ratio test Id tests;
Course Learning Outcomes	On success	sful con	npletion of this course, students	shou	ld be able to:		
	CLO 1 ap	prehen	nd the objectives of statistics and	d its re	elation to probabil	ity theory	
	CLO 2 re	late a r	eal-life problem to a formal frame	eworl	k for statistical infe	erence	
	CLO 3 co	nduct s	standard parametric statistical in	feren	ice by means of e	stimation and hy	pothesis testing
	CLO 4 re	ckon th	e general applicability of statistic	cs in a	a broad range of	subject areas	
Pre-requisites (and Co-requisites and Impermissible combinations)			Probability and statistics I; and ho have passed in STAT3902 S		ical models, or alr	eady enrolled in	this course.
Offer in 2015 - 2016	Y 1st s	em 2	nd sem		E	xamination	Dec May
Offer in 2016 - 2017	Υ				'		'
Course Grade	A+ to F						
Grade Descriptors	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	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	outcom	strate little or no evidence of comman nes. Lack of analytical and critical abilitie dge to solve problems. Organization and	es, log	ical and coherent thin	king. Show very little	or no ability to apply
Course Type	Lecture-bas	sed cou	ırse				
Course Teaching	Activities			Deta	ails		No. of Hours
& Learning Activities	Lectures						36
	Tutorials						12
	Reading /	Self stu	ıdy				100
Assessment Methods and Weighting	Methods		Details		Weighting in fir course grade (ssment Methods to CLO Mapping
	Assignmen	nts	Coursework (assignmer tutorials and a class test)	nts,		25 CLO 1,2,3,4	
	Examination	on	One 2-hour written examination	n		75 CLC	D 1,2,3,4

Required/recommended reading and online materials	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: Upper Saddle River.	
Course Website	moodle.hku.hk	

STAT2603 Data manageme		-	·		Academic		2015	
Offering Department	Statistics 8	& Actuar	ial Science		Quota		50	
Course Co-ordinator	Dr C W Kv	van, Sta	tistics & Actuarial Science (cwkv	/an @hku.hk)				
Teachers Involved		,	stics & Actuarial Science tistics & Actuarial Science					
Course Objectives	and eleme	entary da different	signed for students who want to ata analysis. This course focus data types, manipulate and tra create summary reports and gra	es on using SAS insform data, per	to manage o	datá set inp	out and	d outp
Course Contents & Topics	programm types. Dat	ing topi ta mani	nt system for statistical projecs, including the following: Dapulation. Data transformation. esentation and graphics. Basic of	ita set input an File manipulatio	d output. Wo n. File mana	orking with agement. D	differ Data r	ent da
Course Learning Outcomes	On succes	sful con	npletion of this course, students	should be able to	:			
	CLO 1 a	ccess or	nline help and document					
	CLO 2 us	se Data	Step to create data files					
	CLO 3 su	ummariz	e data by PROC MEANS, PROC	C FREQ, and PR	OC UNIVARIA	ATE		
	CLO 4 w	ork with	numeric, character, and date va	riables and funct	ions in Data S	tep		
	CLO 5 pe	erform c	onditional processing in Data Sto	эр				
	re by pi	estructur y Data roduce h	terative processing in Data Step e SAS data sets by Data Step Step and PROC APPEND; pre high-resolution graphics by PRC d query language	and PROC TRAN esent data in a	NSPOSE; sub readable way	set and me	erge d	ata se
Pre-requisites and Co-requisites and mpermissible combinations)	Pass in ST	AT1600	Statistics: ideas and concepts,	or already enrolle	ed in this cours	se		
Offer in 2015 - 2016	Y 1st	sem 2	nd sem		Examinat	ion	Dec	May
Offer in 2016 - 2017	Υ				,			
Course Grade	A+ to F							
Grade Descriptors	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	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and abilities and logical thinking, and abilities are considered to familiar and some unfamiliar situations. Apply effective organizational and presentational ski					nd abilit	y to app
	С	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					ne cours	
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abiliti limited ability to apply knowledge to solve problems. Apply limited or barely effective organization presentational skills.				ties. Sho		
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little knowledge to solve problems. Organization and presentational skills are minimally effective or ine			very little or	no abilit			
Course Type	Lecture-ba	sed cou	irse					
Course Teaching	Activities	.		Details			No. o	f Hou
& Learning Activities	Lectures							3
	Tutorials							1
	Reading / Self study							10
Assessment Methods	Methods		Details	Weighting course gra		Assessn	nent M	
	Assignme	ents	Coursework (assignmentutorials, and class test(s))	-	40	CLO 1,2,		
	Examinat	ion	One 2-hour written examination		60	CLO 1,2,	3.4.5	6
Required/recommended reading and online materials	Cody, R.P SAS: SAS	.: Learni Certifica	ng SAS by Example: A Program ation Prep Guide: Base Program al Programming in SAS. North C	mer's Guide (Nor ming for SAS 9.	th Carolina: S	AS Institute (SAS Institu	e Inc.,	2007)

	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	moodle.hku.hk

STAT2605 Demographic ar	nd socio-	econon	nic statistics (6 credits)		Acade	mic Year	2015	
Offering Department	Statistics	s & Actua	rial Science		Quota			
Course Co-ordinator	Ms L M	S Kwan, S	Statistics & Actuarial Science (Iu	ıcykwan	@hku.hk)			
Teachers Involved	Ms L M	S Kwan, S	Statistics & Actuarial Science					
Course Objectives	provide of aims to methods	the course covers the major methods for studying demographic and socio-economic statistics, while ovide quantitative information on the essential aspects of the lives of citizens in a territory. The cours to provide students with 1) basic knowledge including the underlying principles of the pertine ethods and statistical indicators; and 2) skills in the statistical descriptions of a territory and the erpretation and application to planning, policy-making and commercial endeavours.						
Course Contents & Topics	Social st Econom Sources	Population structure, fertility, mortality, migration, life tables, population projections; Social statistics on health, housing, labour, and social inequality; Economic statistics on GDP and green GDP, prices; Sources, theory and methods of official statistics; Examples would be especially drawn from Hong Kong, and Mainland China.						
Course Learning Outcomes	On succ	essful co	mpletion of this course, students	should	be able to:			
	CLO 1	describe territory	and interpret major official & o	ther pul	olicly disseminated so	cio-econom	nic statistics of a	
	CLO 2		ppraise and analyse the socio-e Kong and mainland China	economi	c well-being of a territo	ory with par	ticular reference	
	CLO 3	predict a	future situation by assimilating	and der	iving from appropriate	statistics		
	CLO 4	critically	assess statistics reporting					
Pre-requisites (and Co-requisites and Impermissible combinations)	or 2 or e Pass in economi Probabil	quivalent or alrea c data, ity and	in HKDSE Mathematics or Lev); and dy enrolled in any of these c STAT1601 Elementary statistic statistics I, STAT1603 Introd cuarial science	ourses:	BIOL2102 Biostatisti nods, STAT1602 Bus	ics, ECON1 siness stati	1280 Analysis o stics, STAT260	
Offer in 2015 - 2016	Y 2r	nd sem			Exami	nation	May	
Offer in 2016 - 2017	Υ				,			
Course Grade	A+ to F							
Grade Descriptors	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 re course learning outcomes. Show evidence of analytical and critical abilities a knowledge to familiar and some unfamiliar situations. Apply effective organizat					nd logical thinking, and 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.							
	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course lea outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. S limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational presentational skills.						ritical abilities. Show	
	Fail	outcor	nstrate little or no evidence of comma nes. Lack of analytical and critical abilit edge to solve problems. Organization ar	ies, logica	al and coherent thinking. Sh	now very little	or no ability to apply	
Course Type	Lecture-	based co	urse					
Course Teaching	Activiti	es		Detail	S		No. of Hours	
& Learning Activities	Lecture	S					36	
	Tutorial	S					12	
	Reading	g / Self st	udy				100	
Assessment Methods and Weighting	Method	ls	Details		Veighting in final course grade (%)		sment Methods o CLO Mapping	
	Assignments		Coursework (assignme tutorials and a test)	ents,	25	CLO	1,2,3,4	
	Examin	ation	One 2-hour written examination	n	75	CLO	1,2,3,4	
Required/recommended reading and online materials	Pollard A	۸. H., Yus	Statistics (Census & Statistics D ouf F., & Pollard G. N.: Demogra derstanding Economic Statistics	phic Te	chniques (Pergamon F	Press, 1990		

Offering Department	Statiction		rial Science		Quota		
				@	Quota		
Course Co-ordinator			atistics & Actuarial Science (jeffya	во шпки.пк)			
Teachers Involved			atistics & Actuarial Science				
Course Objectives	quantitativ	vely asse	is course is to develop knowledge essing risk. Applications of these a thorough command of probabi	tools to actuaria	ıl science proble	ems wil	l be emphasize
Course Contents & Topics	- Mutually - Addition - Indepen - Combina - Conditio - Bayes T - Random 2. Univar Poisson, bivariate I - Probabil - Cumulat - Mode, m - Variance - Central	ements of exclusive and mu dence of attorial properties of the exclusive dence of the exclusive distributed in the exclusive distrib	of probability in set notation we events tiplication rules f events obability ability and expectations / Law of total probability es pability distributions (including bit exponential, chi-square, beta, istribution ons and probability density function bution functions ercentiles and moments easures of dispersion	Pareto, lognorn			
Course Learning Outcomes	On succe	ssful cor	npletion of this course, students s	should be able to	:		
	CLO 1	underst	and the mathematical theory und	erlving the mode	ern practice of st	atistics	
			•	, ,	•		
	CLO 2 develop skills in probabilistic analysis for problems involving randomness CLO 3 apply techniques in probability and statistics to solve actuarial science problems						
	CLO 3	,			•		
Pre-requisites and Co-requisites and mpermissible combinations)	enrolled in (for stude Not for st	n this co nts outsi udents v	21 Mathematical methods for act urse) or (Pass in MATH1013 Uni de the BSc(ActuarSc) programme who have passed or enrolled in 502 Business statistics, STAT26	versity mathema e); and any of these co	atics II or alread	y énrol 11 Elen	led in this cours
Offer in 2015 - 2016	Y 2nd	d sem			Examinatio	n	May
	V						
Offer in 2016 - 2017	Υ						
	A+ to F						
Course Grade		course	nstrate thorough mastery at an advanced learning outcomes. Show strong analytic t, and ability to apply knowledge to a wire organizational and presentational skills.	cal and critical abiliti de range of complex	es and logical think	ing, with	evidence of origina
Course Grade	A+ to F	course though effectiv Demor course	learning outcomes. Show strong analytic	cal and critical abilitide range of complex enge of knowledge at analytical and critical	es and logical think k, familiar and unfar and skills required for abilities and logical	ing, with miliar situ attaining thinking	evidence of original pations. Apply highling at least most of the and ability to apple
Offer in 2016 - 2017 Course Grade Grade Descriptors	A+ to F	course though effectiv Demor course knowle Demor learnin	learning outcomes. Show strong analytic t, and ability to apply knowledge to a wir e organizational and presentational skills. Instrate substantial command of a broad ra learning outcomes. Show evidence of ai	cal and critical abilitide range of complex angle of knowledge an allytical and critical ions. Apply effective I of knowledge and allytical and critical and crit	es and logical think c, familiar and unfar and skills required for abilities and logical organizational and logical skills required for a abilities and logical	attaining thinking presenta attaining thinking thinking,	evidence of originations. Apply highly g at least most of th, and ability to applitional skills. most of the cours and ability to applit ability to applications.
Course Grade	A+ to F A B	course though effectiv Demor course knowle Demor learnin knowle Demor outcon limited	learning outcomes. Show strong analytic t, and ability to apply knowledge to a wire organizational and presentational skills. It is strate substantial command of a broad rate learning outcomes. Show evidence of a doge to familiar and some unfamiliar situat strate general but incomplete command goutcomes. Show evidence of some an	cal and critical abilitide range of complexinge of knowledge an analytical and critical ions. Apply effective I of knowledge and alytical and critical iderately effective orgowledge and skills real logical thinking, but	es and logical think c, familiar and unfar and skills required for abilities and logical organizational and logical skills required for a abilities and logical lanizational and presequired for attaining t with limited analytic	ing, with miliar situ attaining thinking presenta attaining thinking, sentation some of cal and c	evidence of origina autions. Apply highl g at least most of th , and ability to appl tional skills. most of the cours and ability to appl al skills. I the course learnin riftical abilities. Sho
Course Grade	A+ to F A B C	course though effective perfective perfectiv	learning outcomes. Show strong analytic t, and ability to apply knowledge to a wire organizational and presentational skills. Instrate substantial command of a broad ra learning outcomes. Show evidence of an iddge to familiar and some unfamiliar situat instrate general but incomplete command goutcomes. Show evidence of some and dge to most familiar situations. Apply moon instrate partial but limited command of known in the strate partial but limited command of known in the strate partial but limited command of known in the strate partial but limited command of known in the strate partial but limited command of known in the strate partial but limited command of known in the strate partial but limited command of known in the strate partial but limited command of known in the strate partial but limited command of known in the strategy in	cal and critical abilitide range of complex angle of knowledge an analytical and critical ions. Apply effective or the complex and alytical and critical aderately effective or consultations and control of knowledge and skills red logical thinking, but problems. Apply leading the complex and so the complex and control of knowledge and control of know	es and logical think c, familiar and unfar and skills required for abilities and logical organizational and skills required for abilities and logical anizational and presequired for attaining t with limited analytic imited or barely or skills required for a skills required for a skills required for a skills required for a shills require	ing, with miliar situration attaining thinking presenta attaining thinking, sentation some of call and c effective	evidence of originations. Apply highly at least most of the and ability to applicational skills. most of the course and ability to applial skills. If the course learnin original and the course learning or no ability to appliance the course the course learning or no ability to appliance the course the
Course Grade Grade Descriptors	A+ to F A B C	course though effective per course knowled per course knowled per course knowled per course per cou	learning outcomes. Show strong analytic t, and ability to apply knowledge to a wire organizational and presentational skills. Instrate substantial command of a broad ra learning outcomes. Show evidence of an adge to familiar and some unfamiliar situat instrate general but incomplete command goutcomes. Show evidence of some an adge to most familiar situations. Apply more strate partial but limited command of known and the strate partial but limited command of known evidence of some coherent and ability to apply knowledge to solve tational skills. Instrate little or no evidence of command ness. Lack of analytical and critical abilities didge to solve problems. Organization and	cal and critical abilitide range of complex angle of knowledge an analytical and critical ions. Apply effective or the complex and alytical and critical aderately effective or consultations and control of knowledge and skills red logical thinking, but problems. Apply leading the complex and so the complex and control of knowledge and control of know	es and logical think c, familiar and unfar and skills required for abilities and logical organizational and skills required for abilities and logical anizational and presequired for attaining t with limited analytic imited or barely or skills required for a skills required for a skills required for a skills required for a shills require	ing, with miliar situration attaining thinking presenta attaining thinking, sentation some of call and c effective	evidence of originations. Apply high g at least most of the and ability to apptional skills. most of the cours and ability to appal skills. If the course learnin ritical abilities. Sho organizational and the course learning or no ability to appal skills.
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D	course though effective periods of the course knowled periods of the course knowled periods outcon limited presention outcon knowled periods assed course the course periods outcon knowled periods outcon knowledge periods out	learning outcomes. Show strong analytic t, and ability to apply knowledge to a wire organizational and presentational skills. Instrate substantial command of a broad ralearning outcomes. Show evidence of an adde to familiar and some unfamiliar situat instrate general but incomplete commanding outcomes. Show evidence of some an adde to most familiar situations. Apply more than the properties of the proper	cal and critical abilitide range of complex angle of knowledge an analytical and critical ions. Apply effective or the complex and alytical and critical aderately effective or consultations and control of knowledge and skills red logical thinking, but problems. Apply leading the complex and so the complex and control of knowledge and control of know	es and logical think c, familiar and unfar and skills required for abilities and logical organizational and skills required for abilities and logical anizational and presequired for attaining t with limited analytic imited or barely or skills required for a skills required for a skills required for a skills required for a shills require	ing, with miliar situration attaining thinking presenta attaining thinking, sentation some of call and c effective	evidence of originations. Apply high g at least most of th, and ability to app tional skills. most of the cours and ability to app al skills. f the course learnin ritical abilities. Sho organizational an the course learnin or no ability to app
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D Fail Lecture-b Activitie	course though effective process of the course knowled present the course knowled present prese	learning outcomes. Show strong analytic t, and ability to apply knowledge to a wire organizational and presentational skills. Instrate substantial command of a broad ralearning outcomes. Show evidence of an adde to familiar and some unfamiliar situat instrate general but incomplete commanding outcomes. Show evidence of some an adde to most familiar situations. Apply more than the properties of the proper	cal and critical abilitide range of complexing of knowledge an allytical and critical ions. Apply effective of knowledge and allytical and critical iderately effective orgowledge and skills red logical thinking, bur problems. Apply of knowledge and s, logical and cohere presentational skills	es and logical think c, familiar and unfar and skills required for abilities and logical organizational and skills required for abilities and logical anizational and presequired for attaining t with limited analytic imited or barely or skills required for a skills required for a skills required for a skills required for a shills require	ing, with miliar situration attaining thinking presenta attaining thinking, sentation some of call and c effective	evidence of originations. Apply highly at least most of the and ability to applitional skills. most of the cours and ability to applial skills. the course learnin riftical abilities. Shor organizational and the course learnin or no ability to appliate the course learning the course
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D Fail Lecture-b Activitie Lectures	course though effective present the course knowled present the course knowled present the course pressent the course present the course present the course present th	learning outcomes. Show strong analytic t, and ability to apply knowledge to a wire organizational and presentational skills. strate substantial command of a broad ra learning outcomes. Show evidence of an idge to familiar and some unfamiliar situationstrate general but incomplete command goutcomes. Show evidence of some an idge to most familiar situations. Apply more instrate partial but limited command of known in the strate partial but limited command of known in the strate little or no evidence of command in the strate little or no evidence of commandines. Lack of analytical and critical abilities idge to solve problems. Organization and the strate little or no evidence of commandines. Lack of analytical and critical abilities idge to solve problems. Organization and the strate little or no evidence of commandines. Lack of analytical and critical abilities idge to solve problems. Organization and the strate little or no evidence of commandines. Lack of analytical and critical abilities is the strate little or no evidence of commandines. Lack of analytical and critical abilities is the strate little or no evidence of commandines.	cal and critical abilitide range of complexinge of knowledge an analytical and critical ions. Apply effective I of knowledge and alytical and critical iderately effective orgovered thinking, but problems. Apply I of knowledge and s, logical and cohere presentational skills	es and ogical think, familiar and unfar and unfar and unfar and unfar and skills required for abilities and logical organizational and properties and logical anizational and presequired for attaining the with limited analytic imited or barely easilts required for a skills required for	ing, with miliar situration attaining thinking presenta attaining thinking, sentation some of call and c effective	evidence of originations. Apply highly at least most of the and ability to applitional skills. most of the cours and ability to applia skills. for the course learning ritical abilities. Shororganizational and the course learning or no ability to applia skills. No. of Hour
Course Grade Grade Descriptors Course Type Course Teaching	A+ to F A B C D Fail Lecture-b Activitie Lectures Tutorials	course though effective periods of the course knowled periods of the course knowled periods outcon limited present periods outcon knowled periods assed course seek periods outcon knowled periods outcon knowledge periods outc	learning outcomes. Show strong analytic, t, and ability to apply knowledge to a wire organizational and presentational skills. Instrate substantial command of a broad ralearning outcomes. Show evidence of an aloge to familiar and some unfamiliar situat instrate general but incomplete command go outcomes. Show evidence of some andee to most familiar situations. Apply and the strate partial but limited command of knowness. Show evidence of some coherent and ability to apply knowledge to solve tational skills. Instrate little or no evidence of command ess. Lack of analytical and critical abilities iddge to solve problems. Organization and LITSE	cal and critical abilitide range of complexing of knowledge an allytical and critical ions. Apply effective of knowledge and allytical and critical iderately effective orgowledge and skills red logical thinking, bur problems. Apply of knowledge and s, logical and cohere presentational skills	es and ogical think, familiar and unfar and unfar and unfar and unfar and skills required for abilities and logical organizational and properties and logical anizational and presequired for attaining the with limited analytic imited or barely easilts required for a skills required for	ing, with miliar situration attaining thinking presenta attaining thinking, sentation some of call and c effective	evidence of origin lations. Apply high g at least most of th, and ability to apptional skills. most of the cours and ability to appal skills. f the course learnir ritical abilities. Sho organizational ar the course learnir or no ability to appaffective. No. of Hour
Course Grade Grade Descriptors Course Type Course Teaching & Learning Activities	A+ to F A B C D Fail Lecture-b Activitie Lectures	course though effective present the course knowle course knowle person outcon limited present person outcon knowle assed course s	learning outcomes. Show strong analytic, t, and ability to apply knowledge to a wire organizational and presentational skills. Instrate substantial command of a broad ralearning outcomes. Show evidence of an aloge to familiar and some unfamiliar situat instrate general but incomplete command go outcomes. Show evidence of some andee to most familiar situations. Apply and the strate partial but limited command of knowness. Show evidence of some coherent and ability to apply knowledge to solve tational skills. Instrate little or no evidence of command ess. Lack of analytical and critical abilities iddge to solve problems. Organization and LITSE	cal and critical abilitide range of complexinge of knowledge an analytical and critical ions. Apply effective I of knowledge and alytical and critical iderately effective orgovered thinking, but problems. Apply I of knowledge and s, logical thinking, but problems. Apply I of knowledge and s, logical and cohere presentational skills Details Lutorials/example Weighting	es and logical think, familiar and unfar and unfar and unfar and unfar and skills required for abilities and logical organizational and present an analysis and logical anizational and present and in the skills required for attaining at with limited analytic imited or barely experienced for a sent thinking. Show ware minimally effective classes	ing, with miliar situal attaining thinking presenta attaining thinking, sentation some of cal and ceffective attaining try little tive or ine	evidence of original actions. Apply highly actions. Apply highly g at least most of the and ability to apply tional skills. most of the cours and ability to apply all skills. if the course learning ritical abilities. Show organizational and the course learning or no ability to apply a street when the course when
Course Grade	A+ to F A B C D Fail Lecture-b Activitie Lectures Tutorials Reading	course though effective process of the course knowled present the course knowled present prese	learning outcomes. Show strong analytic t, and ability to apply knowledge to a wire organizational and presentational skills. Instrate substantial command of a broad ra learning outcomes. Show evidence of an adge to familiar and some unfamiliar situat instrate general but incomplete command grate general but incomplete command under to most familiar situations. Apply more instrate partial but limited command of knowns trate partial but limited command of knowns. Show evidence of some ability to apply knowledge to solve tational skills. Instrate little or no evidence of command less. Lack of analytical and critical abilities dige to solve problems. Organization and surse	cal and critical abilitide range of complexinge of knowledge an analytical and critical ions. Apply effective or an alytical and critical ions. Apply effective or derately effective or owledge and skills reduced to the complex of the complex of the complex of knowledge and skills of knowledge and skills of knowledge and skills. Details Weighting course graduations of the course graduation of the course graduations of the course	es and logical think, familiar and unfar and unfar and unfar and unfar and skills required for abilities and logical organizational and present an analysis and logical anizational and present and in the skills required for attaining at with limited analytic imited or barely experienced for a sent thinking. Show ware minimally effective classes	attaining thinking presenta attaining thinking sentation some of cal and c effective attaining ery little tive or ine	evidence of originations. Apply highly at least most of the and ability to apply tional skills. most of the cours and ability to apply all skills. for the course learning the course learning the course learning the course learning or no ability to apply affective. No. of Hour 3 1.

	Engineering (Brooks/Cole, Thomas Learning) S. Ghahramani: Fundamentals of Probability, with Stochastic Processes (2005, 3rd edition) M. Hassett & D. Stewart: Probability for Risk Management (2006, 2nd edition) S.M. Ross: A First Course in Probability (2005, 7th edition) D. Wackerly, W. Mendenhall III & R. Scheaffer: Mathematical Statistics with Applications (2008, 7th edition)
Course Website	moodle.hku.hk

STAT2902 Financial mathe	matics (6	credits)		Academic Yea	ar 2015
Offering Department	Statistics	& Actuar	ial Science		Quota	
Course Co-ordinator	Prof K C	Yuen, Sta	atistics & Actuarial Science (kc)	vuen @hku.hk)		
Teachers Involved	Prof K C	Yuen, Sta	atistics & Actuarial Science			
Course Objectives			uces the fundamental concepts f basic actuarial techniques. Pr			
Course Contents & Topics	amortizat estate me	ion sched ortgage a	e: measurement of interest, and dules and sinking funds; bonds and short sales; stochastic app es, spot rates, forward rates, du	and related securities roaches to interest;	es; practical app and key terms	lications such as real
Course Learning Outcomes	On succe	essful con	npletion of this course, students	should be able to:		
	CLO 1	understar	nd the fundamental concepts of	financial mathematic	S	
	CLO 2 I	learn star	ndard actuarial notations for a v	ariety of annuities		
	CLO 3	do simple	discounted cashflow analysis	using basic annuities		
			operations of some commo s, short sales, and so on	nly-encountered fina	ancial instrumer	nts such as bonds,
		quote int transactio	erest in various modes and ons	determine interest ra	ate based on a	series of financial
	CLO 6	deal with	Exam FM of the Society of Actu	uaries		
Pre-requisites (and Co-requisites and Impermissible combinations)	course; a	nd udents w	1 Probability and statistics: for the have passed in STAT3615			•
Offer in 2015 - 2016	Y 2nd	d sem			Examination	May
Offer in 2016 - 2017	Υ					
Course Grade	A+ to F					
Grade Descriptors	A	course	strate thorough mastery at an advance learning outcomes. Show strong analy , and ability to apply knowledge to a e organizational and presentational ski	rtical and critical abilities a wide range of complex, fa	and logical thinking,	with evidence of original
	В	course	strate substantial command of a broad learning outcomes. Show evidence of dge to familiar and some unfamiliar situ	analytical and critical abi	ities and logical thir	king, and ability to apply
	С	learning	strate general but incomplete comma g outcomes. Show evidence of some dge to most familiar situations. Apply m	analytical and critical abili	ties and logical thin	king, and ability to apply
	D	outcom	strate partial but limited command of k es. Show evidence of some coherent a ability to apply knowledge to solv ational skills.	and logical thinking, but wit	th limited analytical a	and critical abilities. Show
	Fail	outcom	strate little or no evidence of comma es. Lack of analytical and critical abilit dge to solve problems. Organization ar	ies, logical and coherent t	hinking. Show very	little or no ability to apply
Course Type	Lecture-b	ased cou	irse			
Course Teaching	Activitie	es		Details		No. of Hours
& Learning Activities	Lectures	S				36
	Tutorials	;		tutorials/example cl	asses	12
		/ Self stu	ıdy	tutorials/example cl	asses	12
Assessment Methods and Weighting		/ Self stu	Details	Weighting in course grade	final As	
Assessment Methods and Weighting	Reading	/ Self stu	•	Weighting in course grade	final As	100 sessment Methods
	Reading	/ Self stus	Details Coursework (assignme	Weighting in course grade	final As e (%)	100 sessment Methods to CLO Mapping
	Reading Methods Assignm Examina Kellison, Broverma	Self stu	Details Coursework (assignme tutorials, and class test(s))	Weighting in course grade	final As = (%) 25 CL 75 CL	100 sessment Methods to CLO Mapping O 1,2,3,4,5,6 O 1,2,3,4,5,6

STAT3600 Linear statistica	l analysis	s (6 cred	lits)		Academ	ic Year	2015
Offering Department	Statistics	& Actua	ial Science		Quota		
Course Co-ordinator	Prof S M	S Lee, S	tatistics & Actuarial Science (sr	nslee @hk	u.hk)		
Teachers Involved			ics & Actuarial Science tatistics & Actuarial Science				
Course Objectives	techniqu	es investi	ariability is mainly concerned w gate these sources through the ese models.				
Course Contents & Topics	hypothes (2) Multi reduced polynom (3) One- (4) Two- treatmen (5) Unive one-way (6) Regr	sis tests at ple linear vs full main regres way class way class teffects, and two-ession di	regression: least squares mend confidence intervals for regression: least squares mendels, hypothesis tests and cosion. ification models: one-way ANO infication models: interactions, the contrasts, randomised complete oach to linear modelling: dummay (unbalanced) models, ANO agnostics: leverage, residual pation, Cook's distance, multicolling.	ession parethod, ana onfidence VA, analys wo-way A e block de my variable COVA mod blot, norma	ameters, prediction. Allysis of variance, of intervals for regress All Siss of treatment effect NOVA for balanced sign. Bes, 'multiple linear reles, concomitant varial probability plot, o	coefficient of sion paramets, contrast data struct egression' i iables.	of determination eters, prediction es. ures, analysis o representation o
Course Learning Outcomes	On succe	essful cor	npletion of this course, students	should be	e able to:		
	CLO 1	understa	and linear regression model with	n one or m	ultiple independent v	variables	
	CLO 2		and ANOVA models for one and				
	CLO 3	understa	and general linear model with ca	ategorical a	and continuous inde	pendent va	riables
Pre-requisites (and Co-requisites and Impermissible combinations)		tudents w	2 Probability and statistics II; an ho have passed in STAT3907 I		dels and forecasting	, or have al	ready enrolled ir
Offer in 2015 - 2016	Y 1s	t sem 2	nd sem		Examina	ation	Dec May
Offer in 2016 - 2017	Υ				'		
Course Grade	A+ to F						
Grade Descriptors	В	course though effectiv Demor course	strate thorough mastery at an advance learning outcomes. Show strong analyt, and ability to apply knowledge to a e organizational and presentational skill strate substantial command of a broad learning outcomes. Show evidence of	ytical and cri wide range of lls. range of kno analytical ar	tical abilities and logical of complex, familiar and of complex, familiar and of the complex of the complex and skills required and critical abilities and logical and logical abilities and logical a	thinking, with unfamiliar situ ed for attaining gical thinking,	evidence of original ations. Apply highly at least most of the and ability to apply
	С	Demor	dge to familiar and some unfamiliar situ strate general but incomplete comma g outcomes. Show evidence of some dge to most familiar situations. Apply m	nd of knowle analytical an	edge and skills required and critical abilities and log	for attaining gical thinking,	most of the course and ability to apply
	D	Demor outcom limited	strate partial but limited command of k less. Show evidence of some coherent a ability to apply knowledge to solv tational skills.	knowledge are	nd skills required for attai inking, but with limited an	ining some of alytical and cr	the course learning itical abilities. Show
	Fail	outcon	strate little or no evidence of comma les. Lack of analytical and critical abilit dge to solve problems. Organization ar	ies, logical a	nd coherent thinking. She	ow very little o	or no ability to apply
Course Type	Lecture-l	pased cou	ırse				
Course Teaching & Learning Activities	Activitie	es		Details			No. of Hours
a Learning Activities	Lecture	S					36
	Tutorials	S					12
	Reading	g / Self stu	ıdy				100
Assessment Methods and Weighting	Method	s	Details		ighting in final urse grade (%)		sment Methods CLO Mapping
	Assignn	nents	Coursework (assignme tutorials and a test)	ents,	25	CLC	1,2,3
	, toolgiiii						
	Examina	ation	One 2-hour written examination	n	75	CLC	1,2,3
Required/recommended reading and online materials	Examina Michael (McGraw Berry, D. Draper, I Krzanow	H Kutner /-Hill/Irwir A. & Lind N. R. & Si ski, W. J.	One 2-hour written examination, Christopher J. Nachtsheim, Cristing, Sth edition) Igren, B. W.: Statistics: Theory mith, H.: Applied Regression And An Introduction to Statistical M. & Peck, E. A.: Introduction to	John Nete and Methonalysis (Wi Modelling (A	r, William Li: Applie ods (Duxbury Belmon ley, New York, 1998 Arnold, London, 199	ed Linear S nt, 1996)) 8)	itatistical Models

Prof S M S	S Lee, S	rial Science tatistics & Actuarial Science <i>(sn</i>	nslee@	Quo hku.hk)	ıa	
	-	tatistics & Actuarial Science (SII	isiee w	riku.rik)		
PIOI 2 INI S		tatistics & Actuarial Science				
This save	, -		n a ! n 4			and bunathas
testing. U inferential	sing a r	ns, statistical methodologies ar	h, the	course provides a underlying concept	solid and rigo ts and theory	rous treatment of the state of
 Decision Estimation Hypoth 	n theory ation th ness; Ul n. nesis te	: loss function; risk; decision rule leory: exponential families; I MVU estimators; information i sting: uniformly most powerfu	e; admi ikelihoo nequal I test;	ssibility; minimaxity od; sufficiency; m ity; large-sample t monotone likeliho	inimal suffici heory of ma od ratio; unb	iency; ancillarit ximum likelihoo biasedness; UM
On succes	ssful con	npletion of this course, students	should	be able to:		
CLO 1	form a p	panoramic view of classical deve	elopme	nts in mathematical	statistics	
CLO 2	gain the	prough insight into the essentials	of sta	tistical inference		
	•				t related areas	8
Pass in Si	IA I 2602	2 Probability and statistics II or s	51A139	902 Statistical mode	IIS	
Y 1st	sem			Exa	mination	Dec
Υ						
A+ to F						
A	course though	learning outcomes. Show strong analy t, and ability to apply knowledge to a v	tical and vide rand	critical abilities and log	ical thinking, with	evidence of origina
В	course	learning outcomes. Show evidence of	analytica	al and critical abilities an	d logical thinking	, and ability to appl
С	learnin	g outcomes. Show evidence of some a	analytica	and critical abilities an	d logical thinking	, and ability to appl
D	outcom	nes. Show evidence of some coherent a ability to apply knowledge to solv	nd logica	ıl thinking, but with limite	d analytical and	critical abilities. Show
Fail	outcom	nes. Lack of analytical and critical abiliti	es, logic	al and coherent thinking	. Show very little	or no ability to appl
Lecture-ba	ased cou	ırse				
Activities	s		Detail	s		No. of Hours
Lectures						36
Tutorials						12
Reading	/ Self stu	udy				100
Methods	;	Details				sment Methods to CLO Mapping
Assignme	ents	Coursework (assignme tutorials, and a class test)		25	CL	O 1,2,3
Examinat	tion	One 2-hour written examination	n	75	CL	O 1,2,3
Bickel, P. Hall, Uppe Freund, J.	J. & Do er Saddle E.: Mat V. & Cra	sksum, K. A.: Mathematical State e River, N.J., 2001)	istics: all, Eng natical :	Basic Ideas and Se lewood Cliffs, N.J., Statistics (Macmillar	elected Topics 1992) n, New York,	1989)
Singapore	, 1997).	•				•
	inferential particular 1. Paradig 2. Decisio 3. Estimation 4. Hypoti unbiased on success CLO 1 CLO 2 CLO 3 Pass in S Y 1st Y A+ to F A B C D Fail Lecture-ba Activities Lectures Tutorials Reading Methods Assignment Examinat Berry, D. J Bickel, P. Hall, Upper	inferential probler particular for stude 1. Paradigms of in 2. Decision theory 3. Estimation the completeness; Ulestimation. 4. Hypothesis te unbiased test; ma On successful cor CLO 1 form a pCLO 2 gain the CLO 3 build a series in STAT260. Y 1st sem Y A+ to F A Demor course though effective B Demor course though effective B Demor course knowled presen Fail Demor outcon limited presen Fail Demor outcon knowled presen Lecture-based course though fail to be course though the presen Fail Demor outcon knowled presen Examination Berry, D. A. & Line Bickel, P. J. & De Hall, Upper Saddle Demor Saddle Demor Saddle Demor Saddle Demor outcon success and saddle Demor outcon knowled presen Examination Berry, D. A. & Line Bickel, P. J. & De Hall, Upper Saddle Demor Saddle De	inferential problems, statistical methodologies ar particular for students intending to further their studenticular for students intending to further their students. 1. Paradigms of inference: frequentist, Bayesian, I 2. Decision theory: loss function; risk; decision rule 3. Estimation theory: exponential families; I completeness; UMVU estimators; information i estimation. 4. Hypothesis testing: uniformly most powerful intending the statistics. Information of successful completion of this course, students. CLO 1 form a panoramic view of classical deveronal course for panoramic view of classical deveronal course in the statistics. Information of the course of course in the statistics. Information of course in the statistics. Information of course learning outcomes. Show strong analy thought, and ability to apply knowledge to a verificative organizational and presentational skill. B Demonstrate thorough mastery at an advance course learning outcomes. Show evidence of some a knowledge to familiar and some unfamiliar situ. C Demonstrate substantial command of a broad course learning outcomes. Show evidence of some a knowledge to most familiar situations. Apply howledge to most familiar situations. Apply most familiar situat	inferential problems, statistical methodologies and the particular for students intending to further their studies or 1. Paradigms of inference: frequentist, Bayesian, Fisheria 2. Decision theory: loss function; risk; decision rule; admi 3. Estimation theory: exponential families; likelihor completeness; UMVU estimators; information inequal estimation. 4. Hypothesis testing: uniformly most powerful test; unbiased test; maximal invariants; most powerful invariant on successful completion of this course, students should cLO 1 form a panoramic view of classical developme CLO 2 gain thorough insight into the essentials of state CLO 3 build a solid foundation for future research students in STAT2602 Probability and statistics II or STAT38 and thought, and ability to apply knowledge to a wide range effective organizational and presentational skills. B Demonstrate substantial command of a broad range of course learning outcomes. Show evidence of some analytical knowledge to most familiar situations. A C Demonstrate general but incomplete command of knowledge to most familiar situations. Apply moderately course showledge to most familiar situations. Apply moderately initiated ability to apply knowledge to solve proble presentational skills. Fail Demonstrate partial but limited command of knowledge initiated ability to apply knowledge to solve proble presentational skills. Fail Demonstrate little or no evidence of command of knowledge to solve problems. Organization and presentational skills. Reading / Self study Methods Details Coursework (assignments, tutorials, and a class test) Examination One 2-hour written examination Berry, D. A. & Doksum, K. A.: Mathematical Statistics: Hall, Upper Saddle River, N.J., 2001)	inferential problems, statistical methodologies and the underlying conceptoricular for students intending to further their studies or to develop a caree 1. Paradigms of inference: frequentist, Bayesian, Fisherian. 2. Decision theory: loss function; risk; decision rule; admissibility; minimaxity 3. Estimation theory: exponential families; likelihood; sufficiency; mompleteness; UMVU estimators; information inequality; large-sample testimation. 4. Hypothesis testing: uniformly most powerful test; monotone likelihounbiased test; maximal invariants; most powerful invariant test; large-sample to sumbiased test; maximal invariants; most powerful invariant test; large-sample to sumbiased test; maximal invariants; most powerful invariant test; large-sample to sumbiased test; maximal invariants; most powerful invariant test; large-sample to sumbiase dest; maximal invariants; most powerful invariant test; large-sample to sumbiase dest; maximal invariants; most powerful invariant test; large-sample to sumbiase dest; maximal invariants; most powerful invariant test; large-sample to sumbiase destination of this course destination invariants in mathematical CLO 2 gain thorough insight into the essentials of statistical inference CLO 3 build a solid foundation for future research studies in statistics and Pass in STAT2602 Probability and statistics II or STAT3902 Statistical mode of the statistic of the stat	2. Decision theory: loss function; risk; decision rule; admissibility; minimaxity; unbiasednes 3. Estimation theory: exponential families; likelihood; sufficiency; minimal sufficiency applied theory of maestimation. 4. Hypothesis testing: uniformly most powerful test; monotone likelihood ratio; unbiased test; maximal invariants; most powerful invariant test; large-sample theory of like on successful completion of this course, students should be able to: CLO 1 form a panoramic view of classical developments in mathematical statistics. CLO 2 gain thorough insight into the essentials of statistical inference. CLO 3 build a solid foundation for future research studies in statistics and related area: Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models. Y 1st sem Examination Y A+ to F A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills require course learning outcomes. Show strong analytical and critical abilities and logical thinking, with thought, and ability to apply knowledge to a wide range of complex, tramiliar and unfamiliar still some unfamiliar studions. Apply effective organizational and presentational skills. B Demonstrate general but incomplete command of knowledge and skills required for attaining learning outcomes. Show evidence of some analytical and critical abilities and logical thinking knowledge to some analytical and critical abilities and logical thinking knowledge to some outcomes and presentational and presentational skills. C Demonstrate general but innocmplete command of knowledge and skills required for attaining learning outcomes. Show evidence of some analytical and critical abilities and logical thinking knowledge to solve problems. Apply limited or barely effective presentational skills. Fail Demonstrate partial but limited command of knowledge and skills required for attaining outcomes. Show evidence of some analytical and critical abilities goical and coherent thinking. Show very little knowledge to solve problems. A

STAT3603 Probability mode	Academic Year	2015	
Offering Department	Statistics & Actuarial Science	Quota	
Course Co-ordinator	Dr J Song, Statistics & Actuarial Science (txjsong@hku.hk)		

Teachers Involved	Dr J Song,	Statisti	ics & Actuarial Science				
Course Objectives	This is an ir will be discu		ctory course in probability mode	elling.	A range of impor	rtant topics	in stochastic process
Course Contents & Topics	models, clain transient of the arriva Black-Schol	ssifica states al time les or	obability theory, conditional pr tion of states in a Markov chair , Poisson process, distribution of , Brownian Motion, hitting time potion pricing formula, Gaussi g process and renewal process	n, calo of inte and ian b	culation of limiting erarrival time and v maximum variabloridge, and stati	probabilitie waiting time e, geometri onary prod	es and mean time spo e, conditional distribut ic Brownian motion, to cesses. Birth-and-dea
Course Learning Outcomes	On success	ful cor	mpletion of this course, students	sho	uld be able to:		
	CLO 1 ap	oply th	e conditioning method to calcula	ate th	e mean and proba	ability	
			and the essentials of Markov cha		•	•	ownian motion
	CLO 3 ur	ndersta	and how stochastic models can	be ap	oplied to the study	of real-life	phenomena
Pre-requisites (and Co-requisites and Impermissible combinations)	Not for stud and	lents w	1 Probability and statistics I; and the have passed in MATH3603 the have passed in STAT3903 \$	Prob		•	
Offer in 2015 - 2016	Y 1st se	em				Examinatio	on Dec
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	course	nstrate thorough mastery at an advance learning outcomes. Show strong analy t, and ability to apply knowledge to a re organizational and presentational ski	ytical a	and critical abilities and	d logical thinki	ing, with evidence of origin
	В	course	nstrate substantial command of a broad learning outcomes. Show evidence of edge to familiar and some unfamiliar situ	analy	tical and critical abilitie	es and logical	thinking, and ability to app
	С	learnin	nstrate general but incomplete comma g outcomes. Show evidence of some edge to most familiar situations. Apply m	analyti	ical and critical abilitie	s and logical	thinking, and ability to app
	D	outcon	nstrate partial but limited command of knes. Show evidence of some coherent ability to apply knowledge to solvatational skills.	and log	ical thinking, but with I	limited analytic	cal and critical abilities. She
	Fail	outcon	nstrate little or no evidence of comma nes. Lack of analytical and critical abilit edge to solve problems. Organization ar	ies, lo	gical and coherent thir	nking. Show ve	ery little or no ability to app
Course Type	Lecture-bas	sed co	urse				
Course Teaching	Activities			Det	ails		No. of Hou
& Learning Activities	Lectures						
	Tutorials						
	Reading / S	Self stu	udy				10
Assessment Methods and Weighting	Methods		Details		Weighting in fin		Assessment Method to CLO Mappir
	Assignmen	nts	Coursework (assignme tutorials, and a class test)	ents,		25	CLO 1,2,3
	Examination	on	One 2-hour written examination	n		75	CLO 1,2,3
Required/recommended reading and online materials	S. M. Ross:	Introd	luction to Probability Models (9th	h edit	tion)		
Course Website	moodle.hku	ı.hk					

STAT3604 Design and ana	alysis of experiments (6 credits)	Academic Year	2015
Offering Department	Statistics & Actuarial Science	Quota	
Course Co-ordinator	Dr G Li, Statistics & Actuarial Science (csglui@hku.hk)		
Teachers Involved	Dr G Li, Statistics & Actuarial Science		
Course Objectives	Scientific research often requires proper design and analysis of the basic principles of experimental design; to explain the con model-based analysis of experiment.		
Course Contents & Topics	Basic principles and guidelines for designing experiments. An randomised block, crossed and nested factorial structure. Balar squares and related designs. Fixed/random effects models.		
Course Learning Outcomes	On successful completion of this course, students should be ab	le to:	
	CLO 1 develop a conceptual understanding of experimental de	esign	

			ne fundamental statistical too ropriately	ois of	experimental desi	ign and the ur	iderstanding to use
	CLO 3 se	elect app	propriate experimental design	ns for c	lifferent problems		
	CLO 4 se	elect app	propriate statistical model and	d to kn	ow how to validate	the model	
Pre-requisites (and Co-requisites and Impermissible combinations)	aided data		2 Probability and statistics II s	or ST	TAT3902 Statistica	al models or S	TAT3611 Computer-
Offer in 2015 - 2016	Y 2nd	sem			E	Examination	May
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	course thought	strate thorough mastery at an advar learning outcomes. Show strong an t, and ability to apply knowledge to e organizational and presentational s	alytical a wide	and critical abilities an	d logical thinking,	with evidence of original
	В	course	strate substantial command of a broalearning outcomes. Show evidence dge to familiar and some unfamiliar s	of analy	tical and critical abilities	es and logical thin	king, and ability to apply
	С	learning	strate general but incomplete comr g outcomes. Show evidence of som dge to most familiar situations. Apply	ne analy	tical and critical abilitie	es and logical thin	king, and ability to apply
	D	outcom limited	strate partial but limited command o es. Show evidence of some coheren ability to apply knowledge to so	nt and lo	gical thinking, but with	limited analytical a	and critical abilities. Show
		present	ational skills.				
	Fail	Demon	strate little or no evidence of comn es. Lack of analytical and critical ab dge to solve problems. Organization	ilities, lo	gical and coherent thir	nking. Show very I	little or no ability to apply
Course Type	Fail Lecture-ba	Demons outcom knowled	strate little or no evidence of comn es. Lack of analytical and critical ab dge to solve problems. Organization	ilities, lo	gical and coherent thir	nking. Show very I	little or no ability to apply
Course Teaching		Demons outcom knowled	strate little or no evidence of comn es. Lack of analytical and critical ab dge to solve problems. Organization	oilities, lo and pre	gical and coherent thir	nking. Show very I	little or no ability to apply
Course Teaching	Lecture-ba	Demons outcom knowled	strate little or no evidence of comn es. Lack of analytical and critical ab dge to solve problems. Organization	oilities, lo and pre	ogical and coherent thin sentational skills are m	nking. Show very I	ittle or no ability to apply or ineffective.
Course Teaching	Lecture-ba Activities	Demons outcom knowled	strate little or no evidence of comn es. Lack of analytical and critical ab dge to solve problems. Organization	oilities, lo and pre	ogical and coherent thin sentational skills are m	nking. Show very I	ittle or no ability to apply or ineffective.
Course Type Course Teaching & Learning Activities	Lecture-ba Activities Lectures	Demons outcom knowled	strate little or no evidence of comn es. Lack of analytical and critical ab dge to solve problems. Organization	oilities, lo and pre	ogical and coherent thin sentational skills are m	nking. Show very I	ittle or no ability to apply or ineffective. No. of Hours
Course Teaching & Learning Activities	Lecture-ba Activities Lectures Tutorials	Demonsoutcom knowled	strate little or no evidence of comn es. Lack of analytical and critical ab dge to solve problems. Organization	oilities, lo and pre	ogical and coherent thin sentational skills are m	nking. Show very linimally effective of	ittle or no ability to apply or ineffective. No. of Hours 36
Course Teaching & Learning Activities	Lecture-ba Activities Lectures Tutorials Reading /	Demon- outcom knowled	strate little or no evidence of comnes. Lack of analytical and critical abdge to solve problems. Organization	De	ogical and coherent thin sentational skills are metalis tails Weighting in fi	nking. Show very linimally effective of	No. of Hours 36 12 100 seessment Methods
Course Teaching & Learning Activities Assessment Methods	Lecture-ba Activities Lectures Tutorials Reading / Methods	Demon- outcom knowled assed cours	strate little or no evidence of commes. Lack of analytical and critical abdge to solve problems. Organization Irse Idy Details Coursework (assignm	De	ogical and coherent thin sentational skills are metalis tails Weighting in fi	nal Ass (%)	No. of Hours No. of Hours 36 12 100 seessment Methods to CLO Mapping
Course Teaching	Lecture-ba Activities Lectures Tutorials Reading / Methods Assignme Examinati D. C. Mont D. R. Cox: A. L. Edwa G. A. Ferg edition) C. R. Hick: edition) P. W. M. Jo	Demonoutcom knowled assed cours assed cours assed cours assed cours assed cours as a second cours as a	strate little or no evidence of commes. Lack of analytical and critical abdge to solve problems. Organization Irse Details Coursework (assignment tutorials, and a class test)	nents, tion erimer 8) ogical ysis in Conce	weighting in fi course grade (tails Weighting in fi course grade (tts (Wiley, 1997, 4th Research (Harper Psychology and lipts in the Design eriments (Macmilla)	nal Ass (%) 25 C Th edition) & Row, 1985, Education (Mc of Experiment an, 1971)	No. of Hours No. of Hours 36 12 100 sessment Methods to CLO Mapping CLO 1,2,3,4 CLO 1,2,3,4 5th edition) Graw Hill, 1989, 6th s (Oxford, 1999, 5th

STAT3605 Quality control	and man	agement (6 credits)	Academic Year	2015
Offering Department	Statistic	s & Actuarial Science	Quota	
Course Co-ordinator	Dr E A L	Li, Statistics & Actuarial Science (ericli11@hku.hk)		
Teachers Involved	Dr E A L	Li, Statistics & Actuarial Science		
Course Objectives	prosperi the con sequent total qua	scessful control of quality in production is a matter ty. This course provides an overview of quality compron sumer. It presents a variety of statistical solutions in al sampling plans, reliability, and life-testing. Contemposity control, zero defects, six-sigma, and ISO-9000 will ier of today's quality control and management ideas.	nise which involves both to ncluding control charts, rary quality management is	he producer and acceptance and systems such as
Course Contents & Topics	inference curves. scheme	ity distributions and their applications, process e. Process control, variables and attributes or Single, double and sequential sampling plan s. Variables sampling. Reliability and li Management of quality control, total quality control, zero	ontrol charts. Operating is. MIL-STD-105D and ife-testing. Elementary	Dodge-Romig experimental
Course Learning Outcomes	On succ	essful completion of this course, students should be able	to:	
	CLO 1	appreciate the practicality of statistical concepts and me	thods in general	
	CLO 2	understand how certain specific statistical methods can	benefit various production	situations
	CLO 3	know the traditional and modern systems of quality man	agement	

Dec requisites	Doos in F	2101 240	2 Disentationies or (ECONIA200	A 10 0	lucio of companie	مامده مسما	amir I Imbranaitir Iarral O
Pre-requisites (and Co-requisites and Impermissible combinations)	course) of Business	r (STAT statistic	2 Biostatistics or (ECON1280 1601 Elementary statistical me s and any University level 2 uctory statistics and any University	thods cou	s and any Universurse) or STAT260	sity level 2 2 Probabili	course) or (STAT1602 ty and statistics II or
Offer in 2015 - 2016	Y 2nd	sem			E	xamination	n May
Offer in 2016 - 2017	Υ						'
Course Grade	A+ to F						
Grade Descriptors	A	course though	nstrate thorough mastery at an advance learning outcomes. Show strong analy t, and ability to apply knowledge to a re organizational and presentational skil	/tical a	and critical abilities and	logical thinkin	g, with evidence of original
	В	course	nstrate substantial command of a broad learning outcomes. Show evidence of dge to familiar and some unfamiliar situ	analyt	tical and critical abilities	s and logical t	hinking, and ability to apply
	С	learnin	nstrate general but incomplete comma g outcomes. Show evidence of some adge to most familiar situations. Apply m	analyti	ical and critical abilities	and logical th	ninking, and ability to apply
	D	outcom	estrate partial but limited command of k les. Show evidence of some coherent a ability to apply knowledge to solv tational skills.	ind log	gical thinking, but with lin	mited analytica	al and critical abilities. Show
	Fail	outcon	nstrate little or no evidence of commandes. Lack of analytical and critical abiliting to solve problems. Organization and	ies, log	gical and coherent think	king. Show ver	ry little or no ability to apply
Course Type	Lecture-ba	ased cou	ırse				
Course Teaching	Activities	s		Deta	ails		No. of Hours
& Learning Activities	Lectures						36
	Tutorials						12
	Reading	/ Self stu	ıdy				100
Assessment Methods and Weighting	Methods	.	Details		Weighting in fin		Assessment Methods to CLO Mapping
	Assignme	ents	Coursework (assignme tutorials, and a class test)	nts,	2	25	CLO 1,2,3
	Examinat	tion	One 2-hour written examinatio	n	-	75	CLO 1,2,3
Required/recommended reading and online materials	D. C. Mon J. Banks: E. L. Gran I. D. Hill: London, 1 G. B. Wet	ntgomery Principle nt & R. S An Intr 961) herill: Sa	ality Control and Industrial Statis r: Statistical Quality Control (Neverse of Quality Control (New York: Leavenworth: Statistical Quality Control (New York: ampling Inspection and Quality (Statistical Quality Control (New York: Total Quality Control (New York:	w You Wile ty Co on (T	rk: Wiley, 1996, 3rd ey, 1989) Introl (New York: M The Institute of Er rol (London: Methuc	d edition) lcGraw-Hill, ngineering I en, 1977, 2i	1988, 6th edition) nspection Monograph,
Course Website	moodle.hk		. Total addity Control (New To			ora cardon)	
Course Mensile	moodie.nk	.u.iik					

STAT3606 Business logisti	ics (6 cr	edits)	Academic Year	2015
Offering Department	Statistic	s & Actuarial Science	Quota	
Course Co-ordinator	Ms O T	K Choi, Statistics & Actuarial Science (ochoi@saas.hku.hk)		
Teachers Involved	Ms O T	K Choi, Statistics & Actuarial Science		
Course Objectives	capital	business corporations are increasingly using logistics as budgeting problems, production planning, scheduling, transportery. This course addresses the business applications of logistics.	portations and decidi	
Course Contents & Topics	busines	course, students will apply the analytical skills with aid of s logistic problems. Topics include optimization technique I planning, transportation, assignment, inventory control and o	s applied in allocation	
Course Learning Outcomes	On succ	cessful completion of this course, students should be able to:		
	CLO 1	solve linear programming with Graphical approach, Simplex function	method and hands-o	on Excel Solving
	CLO 2	set-up and solve network flow problems using least-cost a approximation.	pproach, MODI meti	nod 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 and Impermissible combinations)	course) Busines (STAT1	BIOL2102 Biostatistics or (ECON1280 Analysis of econo or (STAT1601 Elementary statistical methods and any Uni ss statistics and any University level 2 course) or STAT 603 Introductory statistics and any University level 2 coss: foundations of actuarial science; and	versity level 2 course 2601 Probability an	e) or (STAT1602 id statistics I or

	course.	itadonto	who have passed matriosor	Ope	rations research I, or	have alrea	ay enrolled in this
Offer in 2015 - 2016	Y 1st	t sem			Exa	mination	Dec
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	course though	nstrate thorough mastery at an advance learning outcomes. Show strong analyt, and ability to apply knowledge to a ve organizational and presentational ski	ytical a wide ra	and critical abilities and log	ical thinking, wit	th evidence of origina
	В	course	nstrate substantial command of a broad e learning outcomes. Show evidence of edge to familiar and some unfamiliar situ	f analyt	tical and critical abilities an	id logical thinkin	ng, and ability to apply
	С	learnin	nstrate general but incomplete comma g outcomes. Show evidence of some edge to most familiar situations. Apply m	analyti	cal and critical abilities and	d logical thinkin	ig, and ability to apply
	D	outcom	nstrate partial but limited command of I nes. Show evidence of some coherent a ability to apply knowledge to solv atational skills.	and log	ical thinking, but with limite	d analytical and	l critical abilities. Show
	Fail	outcom	nstrate little or no evidence of comma nes. Lack of analytical and critical abilit adge to solve problems. Organization ar	ties, log	gical and coherent thinking	. Show very little	e or no ability to apply
Course Type	Lecture-b	ased cou	urse				
Course Teaching	Lecture-b		urse	Deta	ails		No. of Hours
		es	urse	Deta	ails		
Course Teaching	Activitie	es S	urse	Deta	ails		36
Course Teaching	Activitie Lectures	es 5		Deta	ails		No. of Hours 36 12
Course Teaching	Activitie Lectures Tutorials	es s / Self stu		Deta	weighting in final	Asse	36 12
Course Teaching & Learning Activities Assessment Methods	Activitie Lectures Tutorials Reading	es s s / Self stu	udy		Weighting in final		36 12 100 ssment Methods
Course Teaching & Learning Activities Assessment Methods	Activitie Lectures Tutorials Reading Methods	es 5 6 7 Self stu s	udy Details Coursework (assignme	ents,	Weighting in final course grade (%)	CL	36 12 100 ssment Methods to CLO Mapping
Course Teaching & Learning Activities Assessment Methods	Activitie Lectures Tutorials Reading Methods Assignm Examina B. Rende Wayne L. H. Taha: F.S. Hillie	es / Self stus / S	Details Coursework (assignment tutorials and a test)	ents, on /sis fortion, 7, 8th eto Ope	Weighting in final course grade (%) 25 75 or Management, 10th of the course grade in the course grade (%)	CL CL edition, Pear national Editi	36 12 100 sssment Methods to CLO Mapping O 1,2,3,4 O 1,2,3,4

STAT3607 Statistics in clin	ical medici	ne and bio-medical research (6 credits)	Academic Year	2015				
Offering Department	Statistics &	Actuarial Science	Quota					
Course Co-ordinator	Prof G Yin,	Prof G Yin, Statistics & Actuarial Science (gyin@hku.hk)						
Teachers Involved	Prof G Yin,	Statistics & Actuarial Science						
Course Objectives	methodolog arise from frequentist	n clinical research, medical data are often observed which motivates the application of statistical methodology to the clinical observational and decision-making process. Also, statistical problems often trise from clinical trial designs. It involves phase I, II, III and IV clinical trial designs, both Bayesian and requentist approaches, sample size and power calculation. No knowledge in biology or medicine issumed; the course provides the necessary biomedical background when the statistical problems are introduced.						
Course Contents & Topics	data analys	The contents of the course include contingency tables, regression models, survival analysis, categori data analysis, Bayesian designs, dose-finding methods, sample size and power calculation, phase I, II a III trial designs, hypothesis testing, adaptive designs.						
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 understand the basic concepts in medical statistics							
	CLO 2 design clinical trials and compute sample sizes							
	CLO 3 conduct statistical inference and apply regression models							
	CLO 4 solve medical problems by using various statistical tests							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in ST	AT2602 Probability and statistics II or STAT3902 Statist	ical models					
Offer in 2015 - 2016	Y 2nd	sem	Examination	May				
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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 origin						

		thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar si effective organizational and presentational skills.					
	cours	onstrate substantial command of a broad se learning outcomes. Show evidence of rledge to familiar and some unfamiliar situ	analyti	ical and critical abilities and	l logical thinking, and ability to apply		
	learn	onstrate general but incomplete comma ing outcomes. Show evidence of some redge to most familiar situations. Apply m	analytic	cal and critical abilities and	logical thinking, and ability to apply		
	outco	onstrate partial but limited command of homes. Show evidence of some coherent and ability to apply knowledge to solventational skills.	and logi	ical thinking, but with limited	I analytical and critical abilities. Show		
	outco	onstrate little or no evidence of comma omes. Lack of analytical and critical abilitived to solve problems. Organization are	ies, log	ical and coherent thinking.	Show very little or no ability to apply		
Course Type	Lecture-based co	ourse					
Course Teaching	Activities		Deta	ails	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 2-hour written examination	tion 75		CLO 1,2,3,4		
Required/recommended reading and online materials	& Hall/CRC, 200 J. Aitchison & J. P. Armitage: Sta P. Armitage: Sec D. Altman: Pract N. E. Breslow & control studies (I D. R. Cox & E. J	J. Aitchison, J. W. Kay & I. J. Lauder: Statistical Concepts and Applications in Clinical Medicine (Chapman & 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-control studies (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	moodle.hku.hk						
Additional Course Information	B. Jones & M. G B. J. T. Morgan: S. J. Pocock: Cli						

STAT3608 Statistical genet	Academic Year	2015							
Offering Department	Statistic	s & Actuarial Science	Quota						
Course Co-ordinator	Prof T V	rof T W K Fung, Statistics & Actuarial Science (wingfung@hku.hk)							
Teachers Involved	Prof T V	V K Fung, Statistics & Actuarial Science							
Course Objectives	identific	nis course aims to provide students with a fundamental knowledge of DNA profiling in humar entification and genetic epidemiology in gene mapping and to understand how statistical theory and ethods are applied to solve forensic DNA and genetic problems.							
Course Contents & Topics	equilibri testing a linkage	This course will cover the following topics: background of genetics; Mendelian inheritance; Hardy-Weinbe equilibrium; linkage equilibrium; chi-square test; likelihood ratio test; exact test; match probability; paterni esting and kinship analysis; DNA mixed stain; relatedness; population structure; gene mapping; parametring analysis; non-parametric linkage analysis; linkage disequilibrium; association designs; case-contrinalysis; family-based association study; quantitative traits.							
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1	CLO 1 understand the fundamental principles in statistical DNA forensics and genetic epidemiology							
	CLO 2 know the usefulness and possible limitations of statistical methodology in human identification and gene mapping								
	CLO 3 provide statistical solutions to specific problems in the field								
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models							
Offer in 2015 - 2016	Y 2	nd sem	Examination	May					
Offer in 2016 - 2017	Y								
Course Grade	A+ to F								
Grade Descriptors	Α								

	cou tho	monstrate thorough mastery at an advanc urse learning outcomes. Show strong anal ught, and ability to apply knowledge to a ective organizational and presentational ski	ytical and critical abilities and log wide range of complex, familiar a	ical thinking, with evidence of original			
	cou	monstrate substantial command of a broad urse learning outcomes. Show evidence of owledge to familiar and some unfamiliar situ	analytical and critical abilities an	d logical thinking, and ability to apply			
	lea	monstrate general but incomplete comma rning outcomes. Show evidence of some owledge to most familiar situations. Apply m	analytical and critical abilities and	d logical thinking, and ability to apply			
	out	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.					
	out	monstrate little or no evidence of comma domes. Lack of analytical and critical abilit owledge to solve problems. Organization ar	ies, logical and coherent thinking	Show very little or no ability to apply			
Course Type	Lecture-based	Lecture-based course					
Course Teaching	Activities		Details	No. of Hours			
& Learning Activities	Lectures			36			
	Tutorials			12			
	Reading / Self	study	10				
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignments	Coursework (assignme tutorials, and a class test)	ents, 25	CLO 1,2,3			
	Examination	One 2-hour written examination	n 75	CLO 1,2,3			
Required/recommended reading and online materials	Ott, J.: Analysis Ziegler, A. and Evett, I. W. and	Klug, W. S. and Cummings, M. R.: Essentials of Genetics (Prentice Hall, 2002) Ott, J.: Analysis of Human Genetic Linkage (The Johns Hopkins University Press, 1999, 3rd ed.) Ziegler, A. and Konig, I.R.: A Statistical Approach to Genetic Epidemiology (Wiley-VCH, 2006) Evett, I. W. and Weir, B. S.: Interpreting DNA Evidence (Sinauer Associates, Inc. Publishers, 1998) Fung, W. K. and Hu, Y. Q.: Statistical DNA Forensics: Theory, Methods and Computation (Wiley, Sussex, 2008)					
Course Website	moodle.hku.hk						

STAT3609 The statistics of	investm	ent risk (6 credits)	Academic Year	2015				
Offering Department	Statistics	atistics & Actuarial Science Quota						
Course Co-ordinator	Dr K P V	Or K P Wat, Statistics & Actuarial Science (watkp@hku.hk)						
Teachers Involved	Dr K P V	/at, Statistics & Actuarial Science						
Course Objectives	uncertair provide a markets	Most investments involve some risk. The decision to invest or not is usually made against a background of incertainty. 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 narkets 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 narkets.						
Course Contents & Topics		of market efficiency, mean-variance portfolio theory, capital ortfolio performance and management, behavioural finance.	asset pricing model, a	arbitrage pricinç				
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 measure risk and return of portfolios							
	CLO 2 apply different approaches in constructing optimal investment portfolios							
	CLO 3 explain and apply asset pricing models and evaluate investment performance							
	CLO 4 explain the concepts of market efficiency and apply appropriate testing procedures to assess different forms of market efficiency							
Pre-requisites (and Co-requisites and Impermissible combinations)	2 course Not for enrolled	Pass in STAT2602 Probability and statistics II or (STAT1603 Introductory statistics and any University leve 2 course) or STAT3611 Computer-aided data analysis or STAT3614 Business forecasting; and Not for students who have passed in FINA2320 Investments and portfolio analysis, or have already enrolled in this course; and Not for BSc(Actuarial Science) students						
Offer in 2015 - 2016	Y 1s	t sem	Examination	Dec				
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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.							

	lear	ed for attaining most of the course ogical thinking, and ability to apply and presentational skills.					
	outo	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.					
	outo	nonstrate little or no evidence of comma comes. Lack of analytical and critical abili wledge to solve problems. Organization a	ties, logical and co	herent thinking. S	Show very little or no ability to apply		
Course Type	Lecture-based of	course					
Course Teaching	Activities		Details		No. of Hours		
& Learning Activities	Lectures				36		
	Tutorials	utorials			12		
	Reading / Self	study			100		
Assessment Methods and Weighting	Methods	Details		ing in final grade (%)	Assessment Methods to CLO Mapping		
	Assignments	Coursework (assignme tutorials and class test(s))	ents,	30	CLO 1,2,3,4		
	Examination	One 2-hour written examination	on	70	CLO 1,2,3,4		
Required/recommended reading and online materials	McGraw-Hill. Elton, E. J., Gr Investment Ana Luenberger, D. Defusco, R. A., CFA Institute Inv Fabozzi, F. J., CAPM to Cointe Ruppert, D. (200	e, A., and Marcus, A. J. (2011 ruber, M. J., Brown, S. J., and lysis (8th Edition). John Wiley. G. (2009). Investment Science (Ir McLeavey, D. W., Pinto, J. E., a vestment Series (2nd Edition). Ne Focardi, S. M., and Kolm, P. N. gration. New Jersey: Wiley. 04). Statistics and Finance: An Intend Chiang, R. C. P. (1997). Thing Kong.	Goetzmann, Waternational Edind Runkle D. Ew Jersey: Wile (2006). Finantroduction. New	/. N. (2011). It ition). Oxford L E. (2007). Qua ey. ncial Modelling v York: Springe	Modern Portfolio Theory and Jniversity Press. ntitative Investment Analysis, of the Equity Market: From er.		
Course Website	moodle.hku.hk						

STAT3610 Risk manageme	nt and in	nsurance (6 credits)	Academic Year	2015				
Offering Department	Statistic	s & Actuarial Science	Quota					
Course Co-ordinator	Dr R W	Dr R W L Wong, Statistics & Actuarial Science (rwong@hku.hk)						
Teachers Involved	Dr R W	Dr R W L Wong, Statistics & Actuarial Science						
Course Objectives	insurand principle individu	To provide knowledge on basic risk and its management, as well as basic financial planning though insurance products, to students. To allow students to understand the statistical, financial and legal principles underlying the techniques for managing the insurable risks faced by organisations and individuals. Aiming at students who have minimal background in quantitative methods, it involves very minimal quantitative calculations and is not available to students majoring in Actuarial Science.						
Course Contents & Topics	- risk in - insural - introdu - fundar - life ins	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, - individual health insurance coverages.						
Course Learning Outcomes	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)	course) Busines (STAT1 statistics	Pass in BIOL2102 Biostatistics or (ECON1280 Analysis of economic data and any University level course) or (STAT1601 Elementary statistical methods and any University level 2 course) or (STAT160 Business statistics and any University level 2 course) or STAT2601 Probability and statistics I of (STAT1603 Introductory statistics and any University level 2 course) or STAT2901 Probability and statistics: foundations of actuarial science. (Not available to Actuarial Science students)						
Offer in 2015 - 2016	Y 2	Y 2nd sem Examination May						
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F	A+ to F						

Grade Descriptors	A	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						
	В	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.						
	С	learni	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	outco	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 co	ourse					
Course Teaching	Activities			Details No. of Ho				
& Learning Activities	Lectures	Lectures				36		
	Tutorials					12		
	Reading	Reading / Self study				100		
Assessment Methods and Weighting	Methods	i	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	Coursework (assignments, tutorials, and a class test)		25	CLO 1,3		
	Examination		One 2-hour written examination		75	CLO 1,2,3,4,5		
Required/recommended reading and online materials		ann, J.,	nciples of Risk Management and Hoyt, R. E. and Sommer, D.:					
Course Website	moodle.hk	ku.hk						

STAT3611 Computer-aided	data ana	alysis (6 credits)	Academic Year	2015				
Offering Department	Statistics	& Actuarial Science	Quota					
Course Co-ordinator	Dr E K F	Or E K F Lam, Statistics & Actuarial Science (hrntlkf@hku.hk)						
Teachers Involved	Dr K Y V	Lam, Statistics & Actuarial Science /u, Statistics & Actuarial Science < Choi, Statistics & Actuarial Science						
Course Objectives	research relations understa concepts	wide range of statistical analyses and methods are presented using data sets from social sciences esearch and scientific studies. Measuring uncertainty, describing patterns of variability and the interelationship between several variables are essential aspects of scientific investigations that require good inderstanding of statistics. This computer-oriented but non-mathematical course develops the important oncepts and methods of statistics. The course makes extensive use of computers through the user iendly statistical software JMP. No knowledge of a programming language is required.						
Course Contents & Topics		Data exploration, formulation of testable hypotheses, the evaluation of evidence and forecasting on the asis of past experience.						
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 summarize and describe the quantitative and qualitative data using some simple statistical measures							
	CLO 2 describe the patterns of variability and the inter-relationship between several continuous or discrete variables							
	CLO 3 carry out simple statistical analyses based on some real life data, formulate testable hypotheses, make appropriate statistical inferences and make interpretations on the findings							
Pre-requisites (and Co-requisites and Impermissible combinations)	course) Business Universi Not for Probabil	Pass in BIOL2102 Biostatistics or (ECON1280 Analysis of economic data and any University level 2 course) or (STAT1601 Elementary statistical methods and any University level 2 course) or (STAT1603 Business statistics and any University level 2 course) or (STAT1603 Introductory statistics and any University level 2 course); and Not for students who have passed in or have already enrolled in any of these courses: STAT260 Probability and statistics I, STAT2901 Probability and statistics: foundations of actuarial science STAT3616 Advanced SAS programming						
Offer in 2015 - 2016	N		Examination					
Offer in 2016 - 2017	N		·					
Course Grade	A+ to F							
Grade Descriptors	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							

	cou	Demonstrate substantial command of a broad range of knowledge and skills required for attaining at course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, an knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentation					
	C Demonstrate general but incomplete command of knowledge and skills required for attaining material learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and knowledge to most familiar situations. Apply moderately effective organizational and presentational states.						
	outo limit	D Demonstrate partial but limited command of knowledge and skills required for attaining sor outcomes. Show evidence of some coherent and logical thinking, but with limited analytical limited ability to apply knowledge to solve problems. Apply limited or barely efferesentational skills.					
	outo	nonstrate little or no evidence of comma comes. Lack of analytical and critical abilit wledge to solve problems. Organization ar	ies, logical and coherent thinking.	Show very little or no ability to apply			
Course Type	Lecture-based	course					
Course Teaching & Learning Activities	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 (assignme practical work, and a term test		CLO 1,2,3			
	Examination	ation One 2-hour written examination 60		CLO 1,2,3			
Required/recommended reading and online materials	edition) E. R. Babbie: T J. E. Freund & G R. Hooke: How D. G. Kleinbau Methods (Duxb	E. R. Babbie: The Practice of Social Research (Wadsworth Pub. Co., Belmont, 7th edition) 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,					
Course Website	moodle.hku.hk						
Additional Course Information	Other reference J. T. McClave 8 M. R. Middleton J. Neter, W. Wa P. Newbold: Sta I. Olkin, L. J. Gl	oSc students having taken STAT1 E. F. H. Dietrich II: Statistics (Maxw. E. Data Analysis Using Microsoft E. sisserman, & G. A. Whitmore: Applatistics for Business and Economic eser, & C. Derman: Probability Mc Introduction to Applied Statistics (ell Macmillian, 5th ed.) XCEL 5.0 (Duxbury) ied Statistics (Allyn and Bacs (Prentice-Hall, International Codels and Applications (Pre	con) nal Editions, 3rd ed.)			

STAT3612 Data mining (6 c		Academic Year	2015					
Offering Department	Statistic	s & Actuarial Science	Quota	50				
Course Co-ordinator	Dr G C	Or G C S Lui, Statistics & Actuarial Science (csglui@hku.hk)						
Teachers Involved	Dr G C	S Lui, Statistics & Actuarial Science						
Course Objectives	fields so these da led to the new are	With an explosion in information technology in the past decade, vast amounts of data appear in a variety of elds such as finance, customer relations management and medicine. The challenge of understanding nese data with the aim of creating new knowledge and finding new relationships among data attributes has ed to the innovative usage of statistical methodologies and development of new ones. In this process, a ew area called data mining is spawned. This course provides a comprehensive and practical coverage of ssential data mining concepts and statistical models for data mining.						
Course Contents & Topics		Data pre-processing, classification and regression trees, credit scoring, kNN classifier, cluster analysis and neural networks.						
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 implement data mining process summarized in the acronym SEMMA which stands for sampling, exploring, modifying, modeling, and assessing data							
	CLO 2 understand and apply a wide range of data mining techniques, and recognize their characteristics, strengths and weaknesses							
	CLO 3 be proficient with the leading data mining softwareSAS Enterprise Miner							
	CLO 4 identify and use appropriate data mining techniques for a data mining project, taking into account both the nature of the data to be mined and the goals of the user of the discovered knowledge							
	CLO 5 evaluate the quality of discovered knowledge, taking into account the requirements of the data mining task being solved and the goals of the user							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in STAT2602 Probability and statistics II or (STAT1603 Introductory statistics and any Ur 2 course) or STAT3902 Statistical models Co-requisites: STAT3600 Linear statistical analysis							

Offer in 2015 - 2016	Y 2nd	sem			Examina	ation	No Exam
Offer in 2016 - 2017	Υ	(
Course Grade	A+ to F						
Grade Descriptors	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	course I	strate substantial command of a broad earning outcomes. Show evidence of ge to familiar and some unfamiliar situ	analytical and critical ab	ilities and lo	gical thinking	, and ability to apply
	С	learning	strate general but incomplete comma outcomes. Show evidence of some lge to most familiar situations. Apply m	analytical and critical abi	lities and log	gical thinking	, and ability to apply
	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	sed cou	rse				
Course Teaching	Activities		Details			No. of Hours	
& Learning Activities	Lectures						36
	Tutorials					12	
	Reading / Self study					100	
Assessment Methods and Weighting	Methods		Details	Weighting i course gra			sment Methods to CLO Mapping
	Assignme	nts			30	CLC	O 1,2,3,5
	Project rep	ports			30	CLO	1,2,3,4,5
	Test				40	С	LO 2,3
Required/recommended reading and online materials	T. Hastie, I Prediction M. Kantard A. Webb: S Shmueli, G Application J. Han & M	Fan, P. N., Steinback, M. and Kumar, V.: Introduction to Data Mining (Addison Wesley, 2014, 3rd edition) F. Hastie, R. Tibshirani, & J. Friedeman: The Elements of Statistical Learning: Data Mining, Inference, and Prediction (Springer, New York, 2008, 2nd edition) M. Kantardzic: Data Mining: Concepts, Models, Methods, and Algorithms (Wiley, 2003) A. Webb: Statistical Pattern Recognition (Wiley, 2011, 2nd edition) Shmueli, G., Patel, N.R. & Bruce, P.C.: Data Mining for Business intelligence: Concepts, Techniques, and Applications in Microsoft Office Excel with XLMiner (Wiley, 2010, 2nd edition) J. Han & M. Kamber: Data Mining: Concepts and Techniques (Morgan Kaufmann, 2011, 3rd edition) Larose, D. T.: Discovering Knowledge in Data: An Introduction to Data Mining (Wiley, 2005)					
Course Website	moodle.hk	u.hk	-				
Additional Course Information	Customer I	Relation	M. J. A. Berry & G. S. Linc ship Management (Wiley, 2011 Mining: Methods and Models	, 3rd edition)	chniques:	For Mark	teting, Sales and

eering (6 credits)	Academic Year	2015			
Statistic	s & Actuarial Science	Quota	50			
Dr C W	or C W Kwan, Statistics & Actuarial Science (cwkwan@hku.hk)					
Dr C W	Kwan, Statistics & Actuarial Science					
methodo collectic particula consum	ology used in the marketing survey process including pro on and analysis, and report writing. Special emphasis arly for analysing marketing data including market seg	blem formulation, sur will be put on statis mentation, market re	vey design, data stical techniques esponse models			
	Marketing decision models, Market response models, Survey research, Statistical methods for segmentation, Statistical methods for positioning, Statistical methods for new product design					
On succ	essful 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, conjoint analysis, choice models, confirmatory factor analysis, and discriminant analysis in market segmentation, positioning and new product design						
course) Busines (STAT1	or (STAT1601 Elementary statistical methods and any Uris statistics and any University level 2 course) or STA	niversity level 2 course T2601 Probability an	e) or (STAT1602 id statistics I oi			
	Statistic Dr C W Dr C W This co methode collectio particula consum studies. Marketir segmen On succ CLO 1 CLO 2 CLO 3 Pass in course) Busines	methodology used in the marketing survey process including procollection and analysis, and report writing. Special emphasis particularly for analysing marketing data including market seg consumer preference analysis and conjoint analysis. Students wi studies. Marketing decision models, Market response models, Surve segmentation, Statistical methods for positioning, Statistical methods. On successful completion of this course, students should be able to: CLO 1 develop hands-on skills of curve fitting and analyzing data variable. CLO 2 understand marketing decision models. CLO 3 understand cluster analysis, factor analysis, multidimension conjoint analysis, choice models, confirmatory factor analysis segmentation, positioning and new product design. Pass in BIOL2102 Biostatistics or (ECON1280 Analysis of econcourse) or (STAT1601 Elementary statistical methods and any Un Business statistics and any University level 2 course) or STA	Statistics & Actuarial Science Dr C W Kwan, Statistics & Actuarial Science (cwkwan@hku.hk) Dr C W Kwan, Statistics & Actuarial Science This course is designed to provide an overview and practical application of trends, methodology used in the marketing survey process including problem formulation, sur collection and analysis, and report writing. Special emphasis will be put on statist particularly for analysing marketing data including market segmentation, market reconsumer preference analysis and conjoint analysis. Students will analyse a variety of studies. Marketing decision models, Market response models, Survey research, Statistics segmentation, Statistical methods for positioning, Statistical methods for new product design. 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 of CLO 2 understand marketing decision models CLO 3 understand cluster analysis, factor analysis, multidimensional scaling, correspor conjoint analysis, choice models, confirmatory factor analysis, and discriminant and control of the control of			

Offer in 2015 - 2016	Y 1st	sem			Exam	ination	Dec	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A Demonstrate thorough mastery at an advanced level of extensive knowledge a course learning outcomes. Show strong analytical and critical abilities and logi thought, and ability to apply knowledge to a wide range of complex, familiar a effective organizational and presentational skills.					ogical thinking, with evidence of original		
	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	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							
	Fail	outcom	nstrate little or no evidence of comma nes. Lack of analytical and critical abilit dge to solve problems. Organization ar	ies, lo	gical and coherent thinking. S	how very little	or no ability to apply	
Course Type	Lecture-ba	ased cou	ırse					
Course Teaching	Activities			Details			No. of Hours	
& Learning Activities	Lectures	Lectures					36	
		Tutorials						
	Tutorials						12	
	Tutorials Reading		udy					
Assessment Methods and Weighting		/ Self stu	udy Details		Weighting in final course grade (%)		12 100 ssment Methods to CLO Mapping	
	Reading	/ Self stu		а			100	
	Reading /	/ Self stu	Details Coursework (assignments,		course grade (%)	CL	100 ssment Methods to CLO Mapping	
	Reading Amethods Assignment Examinat Lattin J., Company Malhotra, Johnson F	/ Self stu s ents tion Carroll J. Naresh: R., Wiche	Details Coursework (assignments, class test and a group project)	nultiv	course grade (%) 50 50 ariate data (Thomson) ientation (Pearson, 2010) Analysis (Prentice Hal	CL CL D, 6th ed.) I, 5th ed.)	ssment Methods to CLO Mapping O 1,2,3	

STAT3614 Business foreca	sting (6	credits)		Academic Year	2015	
Offering Department	Statistic	& Actuarial Science		Quota		
Course Co-ordinator	Dr R W	. Wong, Statistics & Actuarial Science	(rwong @hku.hk)			
Teachers Involved	Dr R W	. Wong, Statistics & Actuarial Science				
Course Objectives	market decade techniq	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 suct techniques that have proven useful to practitioners. The course will involve the use of computer software EXCEL, in the teaching process.				
Course Contents & Topics	moving	Review of basic statistical concepts; autocorrelation analysis; evaluation and combination of forecast moving averages and smoothing methods; simple linear regression; multiple regression; growth curve time series regression; the handling of seasonal cycles; decomposition methods.				
Course Learning Outcomes	On succ	essful completion of this course, studer	nts should be able to:			
	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 addins functions					
Pre-requisites (and Co-requisites and Impermissible combinations)	course) Busines Univers Not for statistic	BIOL2102 Biostatistics or (ECON128 or (STAT1601 Elementary statistical restatistics and any University level y level 2 course); and tudents who have passed or already early STAT2901 Probability and statistics: easting, STAT4601 Time-series analysis	methods and any Unive 2 course) or (STAT16 enrolled in any of these toundations of actuaria	ersity level 2 course 603 Introductory st courses: STAT260 al science, STAT39	e) or (STAT1602 atistics and any 1 Probability and	
Offer in 2015 - 2016	N			Examination		
Offer in 2016 - 2017	N					
Course Grade	A+ to F					
Grade Descriptors	A	Demonstrate thorough mastery at an advar course learning outcomes. Show strong an				

	B Do cc kr C Do lei kr D D oo liin pr Fail Do oo	ought, and ability to apply knowledge to a fective organizational and presentational sk emonstrate substantial command of a broad burse learning outcomes. Show evidence o nowledge to familiar and some unfamiliar sit emonstrate general but incomplete commarning outcomes. Show evidence of some nowledge to most familiar situations. Apply remonstrate partial but limited command of utcomes. Show evidence of some coherent nited ability to apply knowledge to sol esentational skills. emonstrate little or no evidence of commartomes. Lack of analytical and critical abilinowledge to solve problems. Organization a	ills. If range of analytic and of analytic and log ve produced and of ties, log	of knowledge and skills rectical and critical abilities an s. Apply effective organizatic knowledge and skills requical and critical abilities and tely effective organizational adge and skills required for gical thinking, but with limite oblems. Apply limited or knowledge and skills requigical and coherent thinking.	juired for a d logical the anal and prese d logical the and prese attaining sed analytical barely eff red for att Show ver	ttaining at least most of the hinking, and ability to apply esentational skills. taining most of the course inking, and ability to apply ntational skills. The course learning I and critical abilities. Show ective organizational and aining the course learning y little or no ability to apply	
Course Type	Lecture-based	d course					
Course Teaching & Learning Activities	Activities		Det	Details		No. of Hours	
& Learning Activities	Lectures					36	
	Tutorials					12	
	Reading / Sel	If study				100	
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	Α	ssessment Methods to CLO Mapping	
	Assignments	Coursework (assignme tutorials, and a class test)	ents,	40		CLO 1	
	Examination	One 2-hour written examination	on	60		CLO 1,2,3	
Required/recommended reading and online materials	P. E. Gaynor Economics (M	D. W. Wichern, & A. G. Reitsch: Bus & R. C. Kirkpatrick: Introduction to IcGraw-Hill, 1994) T. Bos: Introductory Business & Ed	o Tim	e-series Modelling an	d Foreca	, ,	
Course Website	moodle.hku.hl	ζ					
Additional Course Information		to CompSc students having take nator before choosing this course.	en ST	AT1301. Students sh	ould obt	tain approval from the	

	matics for					
Offering Department	Statistics	& Actuarial Science	Quota			
Course Co-ordinator	Dr E C K	Cheung, Statistics & Actuarial Science (eckc@hku.hk)				
Teachers Involved	Dr E C K	Cheung, Statistics & Actuarial Science				
Course Objectives		focus of this course is built on the concepts on financia cepts are also considered.	al mathematics. Practi	cal applications		
Course Contents & Topics	amortizati	This course covers: simple and compound interest; annuities certain; discounted cash flow analys amortization schedules and sinking funds; yield rates; bonds and related securities; practical application such as real estate mortgage, short sales and term structure of interest rates.				
Course Learning Outcomes	On succe	ssful completion of this course, students should be able to	0:			
	CLO 1 s	solve practical problems relating to annuities certain, simp	le and compound inter	est		
	CLO 2	carry out discounted cash flow analysis				
	CLO 3 apply amortization schedules and sinking funds to the practical problems such as real estate mortgage					
Dra raquiaitas			oiversity level 2 cours	no) or (STAT160		
(and Co-requisites and	Pass in (Business (STAT160 statistics:	STAT1601 Elementary statistical methods and any Unstatistics and any University level 2 course) or ST 33 Introductory statistics and any University level 2 foundations of actuarial science; and udents who have passed in STAT2902 Financial mather	AT2601 Probability a course) or STAT290	nd statistics I of Probability an		
(and Co-requisites and impermissible combinations)	Pass in (Business (STAT160 statistics: Not for st course.	STAT1601 Elementary statistical methods and any Un statistics and any University level 2 course) or ST 03 Introductory statistics and any University level 2 foundations of actuarial science; and	AT2601 Probability a course) or STAT290	nd statistics I of Probability an		
(and Co-requisites and impermissible combinations) Offer in 2015 - 2016	Pass in (Business (STAT160 statistics: Not for st course.	STAT1601 Elementary statistical methods and any Ur statistics and any University level 2 course) or ST 03 Introductory statistics and any University level 2 foundations of actuarial science; and udents who have passed in STAT2902 Financial mathe	AT2601 Probability a course) or STAT290 ematics, or have alrea	nd statistics I of 1 Probability and 1 Probabili		
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017	Pass in (Business (STAT160 statistics: Not for st course. Y 2nd	STAT1601 Elementary statistical methods and any Ur statistics and any University level 2 course) or ST 03 Introductory statistics and any University level 2 foundations of actuarial science; and udents who have passed in STAT2902 Financial mathe	AT2601 Probability a course) or STAT290 ematics, or have alrea	nd statistics I of 1 Probability and 1 Probabili		
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	Pass in (Business (STAT160 statistics: Not for st course. Y 2no	STAT1601 Elementary statistical methods and any Ur statistics and any University level 2 course) or ST 03 Introductory statistics and any University level 2 foundations of actuarial science; and udents who have passed in STAT2902 Financial mathe	AT2601 Probability a course) or STAT290 ematics, or have alrea Examination knowledge and skills require ties and logical thinking, with	nd statistics I of 1 Probability and y enrolled in the May		
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in (Business (STAT160 statistics: Not for st course. Y 2nd Y A+ to F	STAT1601 Elementary statistical methods and any Uristatistics and any University level 2 course) or ST 33 Introductory statistics and any University level 2 foundations of actuarial science; and udents who have passed in STAT2902 Financial mather disemble of sem. Demonstrate thorough mastery at an advanced level of extensive course learning outcomes. Show strong analytical and critical ability to apply knowledge to a wide range of complete.	AT2601 Probability a course) or STAT290 ematics, or have alrea Examination Examination knowledge and skills requirities and logical thinking, without particular and unfamiliar signard skills required for attaining and skills required for attaining all abilities and logical thinking.	nd statistics I of 1 Probability and y enrolled in the May May ad for attaining all the evidence of original trutions. Apply highly and ability to apply and ability to apply to the probability to apply the probability of the probability to apply the probability and the		
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	Pass in (Business (STAT160 statistics: Not for st course. Y 2nd Y A+ to F	STAT1601 Elementary statistical methods and any Ut statistics and any University level 2 course) or ST 03 Introductory statistics and any University level 2 foundations of actuarial science; and udents who have passed in STAT2902 Financial mather density of the seminary	AT2601 Probability a course) or STAT290 ematics, or have alrea Examination Examination knowledge and skills require ties and logical thinking, wit ex, familiar and unfamiliar si abilities and logical thinkin de organizational and present diskills required for attaining abilities and logical thinking	nd statistics I of 1 Probability and y enrolled in the May and for attaining all the hevidence of originatuations. Apply high at least most of the g, and ability to apply and of the course g, and ability to apply and ability and ability to apply and ability		

	outc limite	nonstrate partial but limited command of k omes. Show evidence of some coherent a ed ability to apply knowledge to solv entational skills.	nd logical thinking, but with limit	ed analytical	and critical abilities. Show		
	outo	Fail Demonstrate little or no evidence of command of knowledge and skills required for outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show knowledge to solve problems. Organization and presentational skills are minimally effective.					
Course Type	Lecture-based of	ecture-based course					
Course Teaching & Learning Activities	Activities		Details		No. of Hours		
a Learning Activities	Lectures				36		
	Tutorials				12		
	Reading / Self	study			100		
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)		ssessment Methods to CLO Mapping		
	Assignments	Coursework (assignme tutorials, and a class test)	ents, 25		CLO 1,2,3		
	Examination	One 3-hour written examination	n 75		CLO 1,2,3		
Required/recommended reading and online materials		The Theory of Interest (Irwin: Illino A.: Mathematics of Investment 04, 3rd edition)		blications	- Mad River Books:		
Course Website	moodle.hku.hk						

		ning (6 credits)		Academic Year	2015					
Offering Department	Statistics	cs & Actuarial Science Quota 50 W.No. Statistics & Actuarial Science (kaing@hku.hk)								
Course Co-ordinator	Prof K W	Ng, Statistics & Actuarial Science (kair	ng @hku.hk)							
Teachers Involved	Prof K W	Ng, Statistics & Actuarial Science								
Course Objectives		rse aims to equip students, who have ming for automation of procedures a /.								
Course Contents & Topics	data sim	of SAS underlying parts. Macro pro ulation, advanced data look-up techning and memory.	0		•					
Course Learning Outcomes	On succe	essful completion of this course, student	s should be able to:							
	CLO 1 Understand the system of SAS and basic programming									
	CLO 2									
	CLO 3									
	CLO 4 Use SAS MACRO to develop customized and automated applications									
	CLO 5 Use advanced SAS programming statements and techniques to solve complex problems									
Pre-requisites (and Co-requisites and Impermissible combinations)	science	of Probability and statistics I or STA	•							
Offer in 2015 - 2016	Y 2n	Y 2nd sem Examination May								
		Υ								
Offer in 2016 - 2017	Υ			Examination	iviay					
	Y A+ to F			Examination	iway					
Offer in 2016 - 2017 Course Grade Grade Descriptors	-	Demonstrate thorough mastery at an advancourse learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational sk	lytical and critical abilities wide range of complex, fa	wledge and skills required and logical thinking, with	I for attaining all the					
Course Grade	A+ to F	course learning outcomes. Show strong ana thought, and ability to apply knowledge to a	llytical and critical abilities wide range of complex, faills. d range of knowledge and of analytical and critical abilities.	wledge and skills required and logical thinking, with amiliar and unfamiliar situ skills required for attaining lities and logical thinking,	I for attaining all the evidence of original lations. Apply highly at least most of the and ability to apply					
Course Grade	A+ to F	course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational should be be be been substantial command of a broad course learning outcomes. Show evidence of	llytical and critical abilities wide range of complex, ficills. d range of knowledge and of analytical and critical abituations. Apply effective organd of knowledge and skill analytical and critical abilitial wides.	wledge and skills required and logical thinking, with amiliar and unfamiliar situ skills required for attaining lities and logical thinking, ganizational and presental ills required for attaining lities and logical thinking,	If for attaining all the evidence of original lations. Apply highly at least most of the and ability to apply tional skills. most of the course and ability to apply					
Course Grade	A+ to F A B	course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational should be presented to a broad course learning outcomes. Show evidence of knowledge to familiar and some unfamiliar sit of the presented by the present of the presented by the presented and the presented by the pres	llytical and critical abilities wide range of complex, ficilis. d range of knowledge and of analytical and critical abituations. Apply effective organd of knowledge and skernelly effective organical and critical abilimoderately effective organicknowledge and skills requently and logical thinking, but will	wledge and skills required and logical thinking, with amiliar and unfamiliar situ skills required for attaining litties and logical thinking, ganizational and presental ities and logical thinking, zational and presentations if the for attaining some of the limited analytical and control in the state of	I for attaining all the evidence of original ations. Apply highly at least most of the and ability to apply tional skills. most of the course and ability to apply al skills. the course learning ritical abilities. Show					
Course Grade	A+ to F A B C	course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational shought, and substantial command of a broat course learning outcomes. Show evidence of knowledge to familiar and some unfamiliar sit Demonstrate general but incomplete comm learning outcomes. Show evidence of some knowledge to most familiar situations. Apply to Demonstrate partial but limited command of outcomes. Show evidence of some coherent limited ability to apply knowledge to so	ulytical and critical abilities wide range of complex, faills. d range of knowledge and of analytical and critical abituations. Apply effective organd of knowledge and skip analytical and critical abituations and critical abituations and critical abituations are analytical and critical abituations and critical abituations. Apply effective organic knowledge and skills required and logical thinking, but will have problems. Apply limituation of knowledge and skilties, logical and coherent	wledge and skills required and logical thinking, with amiliar and unfamiliar situ skills required for attaining lities and logical thinking, anizational and presentat ills required for attaining lities and logical thinking, zational and presentations ired for attaining some of th limited analytical and cited or barely effective lills required for attaining thinking. Show very little of the still in the st	If for attaining all the evidence of original lations. Apply highly at least most of the and ability to apply tional skills. The course learning ritical abilities. Show organizational and the course learning or no ability to apply an ability to apply and the course learning or no ability to apply or no ability to apply the evidence of the course learning or no ability to apply the evidence of t					
Course Grade Grade Descriptors	A+ to F A B C D	course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational shows a course learning outcomes. Show evidence or knowledge to familiar and some unfamiliar sit. Demonstrate general but incomplete comm learning outcomes. Show evidence of some knowledge to most familiar situations. Apply to Demonstrate partial but limited command of outcomes. Show evidence of some coherent limited ability to apply knowledge to so presentational skills. Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical ability.	ulytical and critical abilities wide range of complex, faills. d range of knowledge and of analytical and critical abituations. Apply effective organd of knowledge and skip analytical and critical abituations and critical abituations and critical abituations are analytical and critical abituations and critical abituations. Apply effective organic knowledge and skills required and logical thinking, but will have problems. Apply limituation of knowledge and skilties, logical and coherent	wledge and skills required and logical thinking, with amiliar and unfamiliar situ skills required for attaining lities and logical thinking, anizational and presentat ills required for attaining lities and logical thinking, zational and presentations ired for attaining some of th limited analytical and cited or barely effective lills required for attaining thinking. Show very little of the still in the st	If for attaining all the evidence of original lations. Apply highly at least most of the and ability to apply tional skills. The course learning ritical abilities. Show organizational and the course learning or no ability to apply an ability to apply and the course learning or no ability to apply or no ability to apply the evidence of the course learning or no ability to apply the evidence of t					
Course Grade	A+ to F A B C D	course learning outcomes. Show strong and thought, and ability to apply knowledge to a effective organizational and presentational sk Demonstrate substantial command of a broat course learning outcomes. Show evidence of knowledge to familiar and some unfamiliar sill Demonstrate general but incomplete commit learning outcomes. Show evidence of some knowledge to most familiar situations. Apply the Demonstrate partial but limited command of outcomes. Show evidence of some coherent limited ability to apply knowledge to so presentational skills. Demonstrate little or no evidence of commoutcomes. Lack of analytical and critical abil knowledge to solve problems. Organization apply assed course	ulytical and critical abilities wide range of complex, faills. d range of knowledge and of analytical and critical abituations. Apply effective organd of knowledge and skip analytical and critical abituations and critical abituations and critical abituations are analytical and critical abituations and critical abituations. Apply effective organic knowledge and skills required and logical thinking, but will have problems. Apply limituation of knowledge and skilties, logical and coherent	wledge and skills required and logical thinking, with amiliar and unfamiliar situ skills required for attaining lities and logical thinking, anizational and presentat ills required for attaining lities and logical thinking, zational and presentations ired for attaining some of th limited analytical and cited or barely effective lills required for attaining thinking. Show very little of the still in the st	If for attaining all the evidence of original lations. Apply highly at least most of the and ability to apply tional skills. most of the course and ability to apply al skills. the course learning ritical abilities. Show organizational and the course learning or no ability to apply					

	Tutorials			12
	Reading / Self s	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 reading and online materials		n Prep Guide: Advanced Programmi tarpenters Complete Guide to the S c., 2004)		
Course Website	moodle.hku.hk			

STAT3617 Sample survey i	methods (6 cred	its)		Academic Year	2015		
Offering Department	Statistics	& Actua	rial Science		Quota			
Course Co-ordinator	Ms O T K	Choi, S	tatistics & Actuarial Science (oc	hoi @hku.hk)				
Teachers Involved			tatistics & Actuarial Science tatistics & Actuarial Science					
Course Objectives	obtained. etc. Samp	Survey ling me	cover design and implementation design includes overall survey othods include sample size dete ation of parameters from survey	design, design of sar rmination, sampling a	mpling schemes and and non-sampling e	d questionnaires		
Course Contents & Topics	managem simple rai sample s errors and methods	pics may include: survey design and planning; survey quality and ethics; implementation matters literagement of survey staff, respondent relationship and logistical issues; and sampling methods literandom sampling, systematic sampling, stratified sampling, cluster sampling, multi-stage sampling ple size determination, post-stratification, ratio and regression estimation methods, non-sampling and biases, non-responses and missing data. Case studies of major applications of sample survethods in the public and private sectors, with some examples on the analysis and application of the distinct data thus produced, will be discussed.						
Course Learning Outcomes	On succe	ssful co	mpletion of this course, students	should be able to:				
			rate knowledge and understand	ing of the various ste	eps to be taken in t	he planning and		
		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)	University or (STAT statistics	Pass or already enrolled in: BIOL2102 Biostatistics, or (ECON1280 Analysis of economic data and University level 2 course), or (STAT1601 Elementary statistical methods and any University level 2 cour (STAT1602 Business statistics and any University level 2 course), or STAT2601 Probability statistics I, or (STAT1603 Introductory statistics and any University level 2 course), or STAT2601 Probability and statistics: foundations of actuarial science.						
Offer in 2015 - 2016	Y 2nd	Isem			Examination	May		
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	course though effecti	nstrate thorough mastery at an advance learning outcomes. Show strong analy nt, and ability to apply knowledge to a ve organizational and presentational skil	rtical and critical abilities a vide range of complex, fa ls.	and logical thinking, with miliar and unfamiliar situ	evidence of origina lations. Apply highly		
	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 couloutcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilimited ability to apply knowledge to solve problems. Apply limited or barely effective organizations presentational skills.					ritical abilities. Show		
	Fail	outcor	nstrate little or no evidence of comman nes. Lack of analytical and critical abiliti edge to solve problems. Organization an	es, logical and coherent the	ninking. Show very little	or no ability to apply		
Course Type	Lecture-b	ased co	urse					
Course Teaching	Activitie	S		Details		No. of Hours		
& Learning Activities	Lectures					36		
	Tutorials					12		
		/ Self st	udy			100		
Assessment Methods and Weighting	Methods	Reading / Self study Methods Details Weighting in final Asset						

	Assignments	Coursework (assignments, tutorials, and a class test)	25	CLO 1,2,3
	Examination	One 2-hour written examination	75	CLO 1,2,3
Required/recommended reading and online materials	R. L. Scheaffer edition) W. G. Cochran: R. M. Groves, F (John Wiley & S L. Kish: Survey	oling: Design and Analysis, 2nd edition, W. Mendenhall, & R. L. Ott: Eleme Sampling Techniques (John Wiley & Sr. J. Fowler, M. P. Couper, J. M. Lepkovons Ltd., 2009, 2nd edition) Sampling (John Wiley & Sons, Inc., 198., Dillman: How to Conduct Your Own St.	ntary Survey Sampli ons Ltd., 1997) vski, E. Singer, R. To 95)	ing (Duxbury Press, 2011, 7th urangeau: Survey Methodology
Course Website	moodle.hku.hk			

STAT3618 Derivatives and	risk mana	gemer	nt (6 credits)		Academic Year	2015		
Offering Department	Statistics	& Actuai	rial Science		Quota			
Course Co-ordinator	Dr R W L	Wong, S	Statistics & Actuarial Science (rwong@hku.hk)		,		
Teachers Involved	Dr R W L	Wong, S	Statistics & Actuarial Science					
Course Objectives	types of d derivatives basic ide	awadays all risk managers must be well versed in the use and valuation of derivatives. The two be sees of derivatives are forwards (having a linear payoff) and options (having a non-linear payoff). All of rivatives can be decomposed to these underlying payoffs or alternatively they are variations on the sic ideas. This course aims at demonstrating the practical use of financial derivative in an an an an an an an are the concept of no-arbitrage.						
Course Contents & Topics	pricing of parity; val and Amer interpretat	eview of futures, forwards and options and the concept of no arbitrage; hedging strategies using fut cing of forward and futures; interest rate futures and swaps; trading strategies using options; purity; valuation of European and American options using the binomial-tree model; valuation of European and American options pricing model; the Greeks: their calculation erpretation; implied volatility; delta hedging and the role of market-makers; exotic options: Asian optirrier options, compound options, gap options and exchange options.						
Course Learning Outcomes	On succes	sful cor	npletion of this course, studen	ts should be able to:				
	CLO 1 use future, forwards, options and swaps to formulate financial strategies							
		etermin holes fo	e the payoff and the value of ormula	various derivative pro	oducts using binom	ial tree and Blac		
	CLO 3 explain how derivative products can be used as tools to manage financial risk							
	CLO 4 recognize how to decompose complicated derivatives into a profolio of standard derivations							
	enrolled in Not for stu	udents this co	who have passed in STAT3 urse; and tho have passed in FINA2322		already enrolled in			
Offer in 2015 - 2016	Y 1st	sem			Examination	Dec		
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	course though	astrate thorough mastery at an advar learning outcomes. Show strong and t, and ability to apply knowledge to a re organizational and presentational s	alytical and critical abilities a wide range of complex,	s and logical thinking, w	rith evidence of origin		
	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 cours learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to appl knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					ing, and ability to ap		
		learnin	g outcomes. Show evidence of some	e analytical and critical ab	kills required for attain	ing, and ability to appoint attended in the couring most of the couring, and ability to appoint in the couring, and ability to appoint in the couring, and ability to appoint in the couring in the couri		
	D	Demor outcom limited	g outcomes. Show evidence of some	e analytical and critical at moderately effective organ f knowledge and skills req t and logical thinking, but w	kills required for attain, bilities and logical thinki nizational and presentat juired for attaining some with limited analytical an	ing, and ability to apintational skills. Ing most of the couring, and ability to apional skills. In of the course learning of the course learning diritical abilities.		
		learnin knowled Demor outcom limited presen Demor outcom	g outcomes. Show evidence of som dge to most familiar situations. Apply strate partial but limited command or nes. Show evidence of some coheren ability to apply knowledge to so	e analytical and critical at moderately effective orga f knowledge and skills req t and logical thinking, but v olive problems. Apply lin mand of knowledge and s lities, logical and coheren	kills required for attaini polities and logical thinki nizational and presental puired for attaining some with limited analytical an nited or barely effecti kills required for attaini t thinking. Show very lit	ing, and ability to apprentiational skills. Ing most of the cour ing, and ability to apprentiate apprentiation and ability to apprentiate apprentiation and apprentiation and the course learning the course learning the course learning apprentiation and apprentiation a		
Course Type	D	Demoroutcom limited presen Demoroutcom knowle	g outcomes. Show evidence of som dge to most familiar situations. Apply strate partial but limited command or ones. Show evidence of some coheren ability to apply knowledge to so tational skills. Instrate little or no evidence of commes. Lack of analytical and critical abilidge to solve problems. Organization	e analytical and critical at moderately effective organic knowledge and skills required and logical thinking, but valve problems. Apply linuand of knowledge and slities, logical and coheren	kills required for attaini pilities and logical thinki nizational and presentat puired for attaining some with limited analytical an nited or barely effecti kills required for attaini t thinking. Show very lit	ing, and ability to apprentiational skills. Ing most of the cour ing, and ability to apprentiate apprentiation and ability to apprentiate apprentiation and apprentiation and the course learning the course learning the course learning apprentiation and apprentiation a		
Course Teaching	D Fail	Demoroutcon limited presen Demoroutcon knowle	g outcomes. Show evidence of som dge to most familiar situations. Apply strate partial but limited command or ones. Show evidence of some coheren ability to apply knowledge to so tational skills. Instrate little or no evidence of commes. Lack of analytical and critical abilidge to solve problems. Organization	e analytical and critical at moderately effective organic knowledge and skills required and logical thinking, but valve problems. Apply linuand of knowledge and slities, logical and coheren	kills required for attaini pilities and logical thinki nizational and presentat puired for attaining some with limited analytical an nited or barely effecti kills required for attaini t thinking. Show very lit	ing, and ability to apprentiational skills. Ing most of the cour ing, and ability to apprentiate apprentiation and ability to apprentiate apprentiation and apprentiation and the course learning the course learning the course learning apprentiation and apprentiation a		
Course Teaching	D Fail	Demoroutcon limited presen Demoroutcon knowle	g outcomes. Show evidence of som dge to most familiar situations. Apply strate partial but limited command or ones. Show evidence of some coheren ability to apply knowledge to so tational skills. Instrate little or no evidence of commes. Lack of analytical and critical abilidge to solve problems. Organization	e analytical and critical at moderately effective organ f knowledge and skills rec t and logical thinking, but value problems. Apply lin mand of knowledge and s lities, logical and coheren and presentational skills a	kills required for attaini pilities and logical thinki nizational and presentat puired for attaining some with limited analytical an nited or barely effecti kills required for attaini t thinking. Show very lit	ing, and ability to apintational skills. Ing most of the couring, and ability to apional skills. In of the course learning of the course learning diritical abilities. Showe organizational arms the course learning the course		
Course Type Course Teaching & Learning Activities	D Fail Lecture-ba	Demoroutcon limited presen Demoroutcon knowle	g outcomes. Show evidence of som dge to most familiar situations. Apply strate partial but limited command or ones. Show evidence of some coheren ability to apply knowledge to so tational skills. Instrate little or no evidence of commes. Lack of analytical and critical abilidge to solve problems. Organization	e analytical and critical at moderately effective organ f knowledge and skills rec t and logical thinking, but value problems. Apply lin mand of knowledge and s lities, logical and coheren and presentational skills a	kills required for attaini pilities and logical thinki nizational and presentat puired for attaining some with limited analytical an nited or barely effecti kills required for attaini t thinking. Show very lit	ing, and ability to apprentiational skills. Ing most of the courng, and ability to apprentiate the course learning of the course learning districts abilities. Shower organizational arming the course learning the course learni		
Course Teaching	D Fail Lecture-ba Activities Lectures	learnin knowle Demor outcom limited present present outcom knowle	g outcomes. Show evidence of some doe to most familiar situations. Apply instrate partial but limited command or eas. Show evidence of some coheren ability to apply knowledge to so tational skills. Instrate little or no evidence of commes. Lack of analytical and critical abilidge to solve problems. Organization of the control of the	e analytical and critical at moderately effective organ f knowledge and skills rec t and logical thinking, but value problems. Apply lin mand of knowledge and s lities, logical and coheren and presentational skills a	kills required for attaini pilities and logical thinki nizational and presentat puired for attaining some with limited analytical an nited or barely effecti kills required for attaini t thinking. Show very lit	ing, and ability to apintational skills. ng most of the cour ng, and ability to api ional skills. of the course learni d critical abilities. Sh- ve organizational a ng the course learni tle or no ability to api ineffective. No. of Hou		

	Assignments	Coursework (assignments, tutorials, and a class test)	25	CLO 1,3
	Examination	One 2-hour written examination	75	CLO 1,2,3,4
Required/recommended reading and online materials	13, 17-18, 24. McDonald, R. L.:	ns, Futures, and Other Derivatives (F Derivatives Markets (Addison Wesle Management and Financial Institutions	ey, 2006, 2nd edition),	Chapters 1-2, 4-5, 7-14, 23.
Course Website	moodle.hku.hk			

STAT3620 Modern nonpara	metric stati	stics	(6 credits)			Academic Yea	r 2015	
Offering Department	Statistics & A	Actuai	rial Science		(Quota		
Course Co-ordinator	Dr P L H Yu,	Stati	stics & Actuarial Science (plhyu	@hk	u.hk)			
Teachers Involved	Dr P L H Yu,	Depa	artment of Statistics and Actuari	al Sc	cience			
Course Objectives			to acquaint students with the alerric statistical methods for data			roperties and	use of classical a	
Course Contents & Topics	independent	samp	ude: order-statistics; goodnes bles; tests for designed experim strapping methods; nonparame	nents	; permutation test			
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 identify appropriate nonparametric methods for analyzing data							
	CLO 2 perform a variety of nonparametric statistical analyses							
	CLO 3 gain a working proficiency in the use of statistical software for data management and performing basic nonparametric statistical analyses							
	CLO 4 effe	ctivel	y communicate findings and cor	nclus	ions			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in STA	T2602	2 Probability and statistics II					
Offer in 2015 - 2016	Y 1st se	1st sem Examination Dec						
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F	√+ to F						
Grade Descriptors	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-base	ed cou	ırse					
Course Teaching	Activities			Det	ails		No. of Hou	
& Learning Activities	Lectures						3	
	Tutorials						1	
	Reading / S	elf stu	ıdy				10	
Assessment Methods and Weighting	Methods		Details		Weighting in fi		sessment Method to CLO Mappin	
	Assignment	s	Coursework (assignme tutorials and a class test)	nts,		25 (CLO 1,2,3,4	
	Examination	ı	One 2-hour written examinatio	n		75	CLO 1,2,3	
Required/recommended reading and online materials	Hollander, M Gibbons, J.D	l. and). and and	ntroduction to Modern Nonparan Wolfe, D.A.: Nonparametric Sta Chakraborti, S.: Nonparametric Vidakovic, B.: Nonparametric S	atistic Stat	cal Methods, 2nd e tistical Inference,	edition (Wiley, 5th edition (CR	(1999) (2010)	
Course Website	moodle.hku.	•						

STAT3621 Statistical data a	analysis (6 credit	s)		Aca	demic Year	2015	
Offering Department	Statistics	& Actua	rial Science		Quo	ota	50	
Course Co-ordinator	Dr G Tiar	n, Statisti	cs & Actuarial Science (gltian@	hku.h	nk)			
Teachers Involved	Dr G Tiar	n, Statisti	cs & Actuarial Science					
Course Objectives	of the e hypothes important fit the da	suilding on prior coursework in statistical methods and modeling, students will get a deeper understanding f the entire process of data analysis. The course aims to develop skills of model selection and ypotheses 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 t the data. Students will learn how to explore the data, to build reliable models, and to communicate the esults of data analysis to a variety of audiences.						
Course Contents & Topics	and two- variable : higher-wa regressio	scriptive statistics, presentation and visualization of data; Simple statistical analyses for the one-sample d two-sample case using parametric and nonparametric methods; Regression analyses: model fitting iable selection and model diagnostic checking; Analysis of Variance (ANOVA): 1-way, two-way and her-way ANOVA; Covariance analysis; Categorical and count data: binary logistic regression, Poisson pression. all data sets will be presented for modelling and analysis using statistical software for gaining hands-or perience.						
Course Learning Outcomes			npletion of this course, students	shou	ıld be able to:			
	0.0.1							
	CLO 2	summariz	od sense of the problem and ide ze and describe the quantitation measures			•		
			ne association among several co	ontini	ious or discrete varia	hles		
	CLO 4	carry out	appropriate and comprehensielection, perform model diagno inferences, make interpretation	ve sta	atistical analyses ba	sed on real life		
Pre-requisites (and Co-requisites and Impermissible combinations)		STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting (Students are strongly recommended to take STAT2603 Data management with SAS prior to taking this course.)						
Offer in 2015 - 2016	Y 2n	d sem			Exa	mination	May	
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	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 learnin outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Sho limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational an presentational skills.						the course learning ritical abilities. Show	
	Fail						or no ability to apply	
Course Type	Lecture-b	ased cou	ırse					
Course Teaching & Learning Activities	Activitie	es		Deta	ails		No. of Hours	
& Learning Activities	Lectures	3					36	
	Tutorials	3					12	
	Reading	/ Self stu	ıdy				100	
Assessment Methods and Weighting	Method	S	Details		Weighting in final course grade (%)		sment Methods o CLO Mapping	
	Assignm	nents	Coursework (assignments an class test)	d a	50	CLO	1,2,3,4	
	Examina	ation	One 3-hour written examination	n	50	CLO	1,2,3,4	
Required/recommended reading and online materials	edition, C Cody, R. Cody, R. Pearson. Elliott, R. Kleinbau	Cengage (2011). S P. & Sm J. (2009) m, D.G.,	Schafer, D. (2012). The Statist Learning. SAS Statistics by Example. SAS hith, J.K. (2005). Applied Statist. Learning SAS in the Computer Kupper, L.L., Nizam, A. and Muods. 4th edition, Cengage Learning SAS in Compage Learning SAS in the Computer Kupper, L.L., Nizam, A. and Muods. 4th edition, Cengage Learning SAS in the Compage Learning SAS in the Statistics of the Sta	Instit stics r Lab, uller,	tute. and the SAS Progra 3rd edition, Cengagi	amming Langu e Learning.	age, 5th edition	

moodle.hku.hk

STAT3622 Data visualizatio	n (6 credits)			Aca	demic Year	2015
Offering Department	Statistics & A	Actuaria	al Science		Qu	ota	
Course Co-ordinator	Dr P L H Yu	, Statist	ics & Actuarial Science (plhyu	@hku	.hk)		
Teachers Involved	Dr P L H Yu	, Statist	ics & Actuarial Science				
Course Objectives	communicat	e and a	cus on how to work with stat nalyze data. Students will lear lly evaluate them.				
Course Contents & Topics	Grammar of relationships		cs, visualizing patterns over tin izing texts.	ne, vis	ualizing relationship	, visualizing s	patial
Course Learning Outcomes	On successf	ul com	oletion of this course, students	shoul	ld be able to:		
	CLO 1	CLO 1 choose the best chart that fits the data					
	CLO 2	create	a compelling visualization usi	ng co	mputer software		
	CLO 3 communicate effectively using statistical graphics						
	CLO 4	critica	lly evaluate graphics and sugg	est im	nprovements		
Pre-requisites (and Co-requisites and Impermissible combinations)	STAT2602 F	Probabi	ity and statistics II				
Offer in 2015 - 2016	N	Examination					
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	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 learnin 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-base	ed cour	se				
Course Teaching	Activities			Deta	ils		No. of Hours
& Learning Activities	Lectures						36
	Tutorials						12
	Reading / S	Self stud	ly				100
Assessment Methods and Weighting	Methods		Details		Weighting in fina		ssment Methods to CLO Mapping
	Presentatio	n	oral presentation and in-	class	4	0 CL	O 1,2,3,4
	Project repo	orts	written report		6	0 CL	O 1,2,3,4
Required/recommended reading and online materials	Tufle, Edwar Chang, Wins Murray, Dan	rds R. (ston (20 (2013) ∋, S. (2	i. Visualize This: The FlowingD 2001). The Visual Display of C 013). R Graphics Cookbook. O . Tableau Your Data!: Fast and 014). Visual Storytelling with	uantit Reilly d Easy	ative Information. 2 Media. y Visual Analysis wi	nd edition, Gra th Tableau So	aphics Press. ftware. Wiley.
	moodle.hku.	•					

STAT3799 Directed studie	es in statistics (6 credits)	Academic Year	2015
Offering Department	Statistics & Actuarial Science	Quota	30
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 repo	orts, Statistics & Actua	rial Science
Course Objectives	To enhance students' knowledge of a particular topic and students' self skills.	-directed learning and	I critical thinking

Course Contents & Topics	member. can be a	The topic is critical revie	tes a self-managed study or preferably one not sufficient w or a synthesis of published tts' understanding of the subje	ly coved	ered in the regular on the subject, or	curriculum. a laborator	The directed study y or field study		
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 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 w	rite succinct	reports on the findings of a re	esearcl	h study				
	CLO 4 m	ake concise	oral presentation of the finding	ngs of a	a research study				
Pre-requisites (and Co-requisites and Impermissible combinations)	STAT6XX Not for stu This capst the conser	in at least 24 credits of advanced level disciplinary core/elective courses (STAT3XXX 6XXX) in the Major in Risk Management/Statistics/Decision Analytics; and or students who have already enrolled in STAT4799 Statistics project in this academic year capstone course is for Decision Analytics, Risk Management, and Statistics Majors only onsent of course coordinator. This course is mutually exclusive with STAT4710. Parliest that a student is allowed to take this capstone course is their year 3 study.							
Offer in 2015 - 2016	Y 1st	sem 2nd s	em		Exa	mination	No Exam		
Offer in 2016 - 2017	Υ	Υ							
Course Grade	A+ to F	+ to F							
Grade Descriptors	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 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.]								
	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. 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. Apply moderately effective organizational and presentational skills.								
	D	coherent an sources, bu	e partial but limited grasp, with reter d logical thinking, but with limited and t mainly through summary rather tha oriate conclusions. Apply limited or bar	alytical a an analy	and critical abilities. Den sis and comparison. Lir	monstrate use a mited ability to	and reference of several use data and results to		
	Fail	analytical ar of them. Mi	e evidence of little or no grasp of the k id critical abilities, logical and coherer suse of data and results and/or una nimally effective or ineffective.	nt thinkin	ng. Limited use of second	dary sources ar	nd no critical comparison		
Course Type	Project-ba	sed course							
Course Teaching & Learning Activities	Activities	,		Deta	ils		No. of Hours		
a Learning Activities	Reading /	Self study		arran	ussion & meeting nged by the stude rvisor		120		
	Methods		Details		Weighting in fin		sessment Methods		
Assessment Methods and Weighting	Mounda						to CLO Mapping		
	Oral pres	entation	oral presentation & in- discussion	-class	, , , , , , , , , , , , , , , , , , ,	10	CLO 1,2,4		
				-class	4		0		

STAT3901 Life contingenc									
Offering Department	Statistic	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	Prof K C Yuen, Statistics & Actuarial Science							
Course Objectives	framewo insurano develop	ujor objectives of this course are to integrate life of the time-until-death random variable is the basic bes, designed to reduce the financial impact of the led. This course introduces the concepts of life contingency g life insurance products.	uilding block by which andom event of untim	models for life nely death, are					
Course Contents & Topics		cs include: survival distributions; life table functions; se life annuity models; benefit premiums; benefit reserves.	lect and ultimate tables	s; life insurance					
Course Learning Outcomes	On succ	essful completion of this course, students should be able to	:						
	CLO 1 calculate the expected values, variances, probabilities, and percentiles for survival-time ravariables								
	CLO 2								

			e continuous survival-time rand ariable using some assumption			from the disc	crete survival-time	
			esent-value-of-benefit random v		•	val-time rando	om variables	
	ran	dom	d calculate the expected values variables, present-value-of-loss ariables					
	CLO 5 cal	culate	benefit premiums for life insura	nces	and annuities			
	CLO 6 cal	culate	benefit reserves for life insuran	ces a	and annuities			
	CLO 7 cov	er par	t of Exam MLC of the Society o	f Act	uaries			
Pre-requisites (and Co-requisites and Impermissible combinations)	(Pass in STAT2602 Probability and statistics II and STAT3615 Practical mathematics for investment) or (Pass in STAT2902 Financial mathematics and (Pass in STAT3902 Statistical models, or already enrol in this course)) or (Pass in STAT2602 Probability and statistics II and STAT2902 Financial mathematics)						,	
Offer in 2015 - 2016	Y 1st se	em			Ex	amination	Dec	
Offer in 2016 - 2017	Υ						·	
Course Grade	A+ to F							
Grade Descriptors	A	course	strate thorough mastery at an advance learning outcomes. Show strong analy t, and ability to apply knowledge to a e organizational and presentational skil	rtical a	and critical abilities and le	ogical thinking, w	ith evidence of original	
	course learning outcomes. Show evidence				broad range of knowledge and skills required for attaining at least most of the nce of analytical and critical abilities and logical thinking, and ability to apply ar situations. Apply effective organizational and presentational skills.			
	learning outcomes. Show evidence of so				command of knowledge and skills required for attaining most of the course some analytical and critical abilities and logical thinking, and ability to apply Apply moderately effective organizational and presentational skills.			
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learnin outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Sho limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational an presentational skills.						d critical abilities. Show	
	Fail	outcom	strate little or no evidence of commandes. Lack of analytical and critical abilitidge to solve problems. Organization an	es, lo	gical and coherent thinking	ng. Show very litt	le or no ability to apply	
Course Type	Lecture-bas	ed cou	ırse					
Course Teaching	Activities			Det	ails		No. of Hours	
& Learning Activities	Lectures						36	
	Tutorials						12	
	Reading / S	Self stu	ıdy				100	
Assessment Methods and Weighting	Methods		Details		Weighting in fina		essment Methods to CLO Mapping	
	Assignments		Coursework (assignme tutorials, and a class test)	nts,	2	CLO	1,2,3,4,5,6,7	
	Examinatio	n	One 3-hour written examinatio	n	7:	CLO	1,2,3,4,5,6,7	
Required/recommended reading and online materials	edition), Itas Dickson, C	ca, Illi .M.D.,	ber, H.U., Hickman, J.C., Jones nois: The Society of Actuaries Hardy, M.R., and Waters, H bridge University Press, 2009)				,	
Course Website	moodle.hku	hk	,					

STAT3902 Statistical mode	s (6 credits)		Academic Year	2015				
Offering Department	Statistics & Actuarial Science Quota							
Course Co-ordinator	Dr G Tian, Statistics & Actuarial Science (gltian@hku.hk)							
Teachers Involved	Dr G Tian, Statistics & Actuarial Science							
Course Objectives	This course is on the basis of 'STAT2901 Profurther study the concepts and methods of shypothesis testing, the two major areas of stawill be equipped with both quantitative skill statistical analysis of data.	tatistics. The course will atistical inference. Through	lay emphasis on the gh the study of this	e estimation and course, students				
Course Contents & Topics	Distribution and density of function of randor likelihood estimator (MLE), moment estimator properties of MLE; Confidence interval estimatormal variance, the ratio of two normal variances.	ator, Bayesian estimator ations for normal mean, inces, and large-sample of	r, properties of est the difference of two confidence intervals:	timators, limiting o normal means,				
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 understand the importance of suffice such as point estimation, confidence	` ,		stical inferences				

	CLO 2 de	erive ma	aximum likelihood estimators of	paramete	rs to calculate max	xımum iikelin	ood estimates	
	CLO 3 lo	CLO 3 locate pivotal quantity to construct confidence intervals of parameters CLO 4 find testing statistic to test hypotheses associated with one-sample and/or two-sa						
			ng statistic to test hypotheses ons with small sample sizes and					
Pre-requisites (and Co-requisites and Impermissible combinations)	Not for stu	Pass in STAT2901 Probability and statistics: foundations of actuarial science; and Not for students who have passed in STAT2602 Probability and Statistics II, or already enrolled i course; and For BSc(Actuarial Science) students only.						
Offer in 2015 - 2016	Y 1st s	1st sem Examination Dec						
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	though effective	estrate thorough mastery at an advance learning outcomes. Show strong analy t, and ability to apply knowledge to a ve organizational and presentational skil	rtical and cri wide range of ls.	tical abilities and logic of complex, familiar an	al thinking, with ad unfamiliar situ	evidence of original uations. Apply highly	
	В	course	nstrate substantial command of a broad learning outcomes. Show evidence of edge to familiar and some unfamiliar situ	analytical ar	nd critical abilities and	logical thinking	, and ability to apply	
	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	outcon	nstrate little or no evidence of comman nes. Lack of analytical and critical abiliti dge to solve problems. Organization an	es, logical a	nd coherent thinking.	Show very little	or no ability to apply	
Course Type	Lecture-ba	sed cou	ırse					
Course Teaching	Activities			Details			No. of Hours	
& Learning Activities	Lectures						36	
	Tutorials						12	
	Reading /	Self stu	ıdy				100	
Assessment Methods and Weighting	Methods		Details		ighting in final urse grade (%)		sment Methods o CLO Mapping	
	Methods Assignme	nts	Details Coursework (assignme tutorials, and a class test)	со		t		
			Coursework (assignme	nts,	urse grade (%)	CLO	o CLO Mapping	
	Assignme Examinati Miller I. & Internations Hogg R. V 2005, 6th e Arnold S. F Larsen R.	Miller al, 2004 ., McKe edition) F.: Math J. and	Coursework (assignme tutorials, and a class test)	nts, n matical Si uction to	urse grade (%) 25 75 tatistics with App Mathematical State	CLO CLO lications (Pe	o CLO Mapping 1,2,3,4 1,2,3,4 earson Education con Prentice Hall,	
and Weighting Required/recommended reading	Assignme Examinati Miller I. & Internations Hogg R. V 2005, 6th e Arnold S. F Larsen R.	on Miller al, 2004 ., McKedition) F.: Math J. and al Editio	Coursework (assignme tutorials, and a class test) One 3-hour written examinatio M.: John E. Freund's Mather 4, 7th edition) ean J. W. & Craig A. T.: Introd ematical Statistics (Prentice-Ha Marx M. L.: An Introduction to	nts, n matical Si uction to	urse grade (%) 25 75 tatistics with App Mathematical State	CLO CLO lications (Pe	o CLO Mapping 1,2,3,4 1,2,3,4 earson Education con Prentice Hall,	

STAT3903 Stochastic mod	els (6 cre	dits)			Academic Year	2015
Offering Department	Statistics					
Course Co-ordinator	Dr Y K C	hung, Statistics & Actu	arial Science (yukchung@hk	ku.hk)		·
Teachers Involved	Dr Y K C	hung, Statistics & Actu	arial Science			
Course Objectives		n introductory course in scussed.	n probability modelling. A rai	nge of impo	ortant topics in stoc	hastic processes
Course Contents & Topics	models, in transic of the a Black-Sc	classification of states ent states, Poisson pro- rival time, Brownian M holes option pricing	ry, Conditional probability a in a Markov chain, calculation cess, distribution of interarrivation, hitting time and max formula, Gaussian bridged renewal process may also be	on of limiting al time and kium variable, and sta	g probabilities and waiting time, conditile, geometric Browtionary processes.	mean time spent tional distribution nian motion, the
Course Learning Outcomes	On succ	essful completion of thi	s course, students should be	able to:		
	CLO 1	apply the conditioning	method to calculate the mea	an and prob	ability	
	CLO 2	understand the essen	tials of Markov chains, the Po	oisson proc	ess, and Brownian	motion
	CLO 3	understand how stoch	astic models can be applied	to the stud	y of real-life phenon	nena
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in		dents only; and and statistics: foundations of a sed in MATH3603 Probability			ed in this course

	and Not for stud	Not for students who have passed in STAT3603 Probability modelling, or have already enrolled course.							
Offer in 2015 - 2016	Y 2nd s	sem			Exa	mination	May		
Offer in 2016 - 2017	Υ	Υ					'		
Course Grade	A+ to F								
Grade Descriptors	Α	course lead thought, ar	te thorough mastery at an advanc ning outcomes. Show strong anal d ability to apply knowledge to a ganizational and presentational sk	ytical wide	and critical abilities and log	ical thinking, wi	th evidence of original		
	В	course lear	te substantial command of a broad ning outcomes. Show evidence o to familiar and some unfamiliar sit	f analy	tical and critical abilities ar	nd logical thinkir	ng, and ability to apply		
	С	learning ou	te general but incomplete comma tcomes. Show evidence of some to most familiar situations. Apply r	analy	tical and critical abilities an	d logical thinkin	g, and ability to apply		
	D	Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learnin outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Sho limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational an presentational skills.							
	Fail	outcomes.	te little or no evidence of comma Lack of analytical and critical abili to solve problems. Organization a	ties, Ic	gical and coherent thinking	. Show very littl	e or no ability to apply		
Course Type	Lecture-bas	sed course	•						
Course Teaching	Activities			De	tails		No. of Hours		
& Learning Activities	Lectures						36		
	Tutorials						12		
	Reading / Self study						100		
Assessment Methods and Weighting	Methods	De	etails		Weighting in final course grade (%)	Asse	ssment Methods to CLO Mapping		
	Assignmen	nte -	oursework (assignme orials, and a class test)	ents,	25	CI	_O 1,2,3		
	Examinatio	on Oi	ne 3-hour written examination	on	75	CI	_O 1,2,3		
Required/recommended reading	S. M. Ross:	Introduct	on to Probability Models (9)	h edi	ition)				
and online materials									

STAT3904 Corporate finance	ce for ac	tuarial science (6 credits)	Academic Year	2015
Offering Department	Statistic			
Course Co-ordinator	Dr J K \	Voo, Statistics & Actuarial Science (jkwoo@hku.hk,)	
Teachers Involved	Dr J K \	Voo, Statistics & Actuarial Science		
Course Objectives	Actuarie finance	urse is designed for actuarial science students to ss. The objective of this course is to introduce stu- The course will provide students with a systemati- incing decisions for corporations.	dents to the fundamental princi	ples of corporate
Course Contents & Topics	topics of value a theory, some i leverag variance	t part of the course will give an introduction to corpovered in STAT2902 and STAT3615. These included net present value, financial instruments and dibinomial model and Black-Scholes option pricing for mportant topics of corporate finance including and firm value, market efficiency, risk and return analysis, CAPM, long term financing, measurance using various measures.	ude: financial markets and co- ividends derivatives market, no ormula. The main part of the co- capital structure and dividend irn, investment decision using	mpanies; presen -arbitrage pricing urse will focus or policy, financia Markowitz mear
Course Learning Outcomes	On suc	cessful completion of this course, students should b	e able to:	
	CLO 1	understand the factors to be considered by a comdividend policy, and also the impact of financial lecapital structure		
	CLO 2	calculate the value of bonds and stocks		
	CLO 3	assess financial performance using various measi	ures	
	CLO 4	understand the mean-variance portfolio theory		
Pre-requisites (and Co-requisites and Impermissible combinations)	STAT3	in ACCT1101 Introduction to accounting and S s10 Risk management and insurance and STAT361 students who have passed in FINA1310 Corporate	15 Practical mathematics for inv	estment)]; and
Offer in 2015 - 2016	Y 2	nd sem	Examination	May
Offer in 2016 - 2017	Υ		,	'

Course Grade	A+ to F								
Grade Descriptors	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	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	learnin	nstrate general but incomplete comma ig outcomes. Show evidence of some adge to most familiar situations. Apply n	analyt	ical and critical abilities and lo	gical thinking, and ability to apply			
	D	outcon	nstrate partial but limited command of lines. Show evidence of some coherent ability to apply knowledge to solutational skills.	and log	gical thinking, but with limited a	nalytical and critical abilities. Show			
	Fail	outcon	nstrate little or no evidence of commanes. Lack of analytical and critical abilitiedge to solve problems. Organization at	ties, lo	gical and coherent thinking. Sh	ow very little or no ability to apply			
Course Type	Lecture-l	pased co	urse						
Course Teaching	Activitie	tivities		Det	ails	No. of Hours			
& Learning Activities	Lectures	S				36			
	Tutorials	S				12			
	Reading	g / Self st	udy			100			
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Assignn	nents	Coursework (assignments tutorials, and a class test)		25	CLO 1,2,3,4			
	Examina	ation	One 3-hour written examination	n	75	CLO 1,2,3,4			
Required/recommended reading and online materials	Ross, S.	A., West	ers S. C. and Allen, F.: Principle erfield, R. W. and Jaffe, J.: Corp : Investment Science (1998)						
Course Website	moodle.h	nku.hk							

	ınancıaı	derivatives (6 credits)	Academic Year	2015					
Offering Department	Statistics	& Actuarial Science	Quota						
Course Co-ordinator	Dr E C k	Or E C K Cheung, Statistics & Actuarial Science (eckc@hku.hk)							
Teachers Involved	Dr E C k	Or E C K Cheung, Statistics & Actuarial Science							
Course Objectives		This course aims at providing an understanding of the fundamental concepts of financial der Emphases are on basic trading and hedging strategies, and the concept of no-arbitrage.							
Course Contents & Topics	Derivatives; short-selling; forward contracts; call options; put options; equity-linked CD; spi collars; hedging; financial forwards and futures; commodity swaps; interest rate swaps; put-call page 1.								
Course Learning Outcomes	On succ	essful completion of this course, students should be able to:							
	CLO 1	define and recognize the definitions of terms commonly use	ed in derivatives marke	ets					
	CLO 2	evaluate the payoff and profit of basic derivative contracts and swaps	s, including forwards,	ncluding forwards, futures, options					
	CLO 3	explain how derivative securities can be used as tools to make	anage financial risk						
Pre-requisites (and Co-requisites and		STAT2902 Financial mathematics; and (Actuarial Science) students only; and							
(and Co-requisites and	For BSc Not for enrolled	(Actuarial Science) students only; and students who have passed in STAT4603 Derivatives and in this course; and tudents who have passed in FINA2322 Derivatives, or have	,						
(and Co-requisites and Impermissible combinations)	For BSc Not for enrolled Not for s	Actuarial Science) students only; and students who have passed in STAT4603 Derivatives an in this course; and	,						
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016	For BSc Not for enrolled Not for s	Actuarial Science) students only; and students who have passed in STAT4603 Derivatives and in this course; and tudents who have passed in FINA2322 Derivatives, or have	already enrolled in th	is course.					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017	For BSc Not for enrolled Not for s	Actuarial Science) students only; and students who have passed in STAT4603 Derivatives and in this course; and tudents who have passed in FINA2322 Derivatives, or have	already enrolled in th	is course.					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade Grade Descriptors	For BSc Not for enrolled Not for s Y 1s	Actuarial Science) students only; and students who have passed in STAT4603 Derivatives and in this course; and tudents who have passed in FINA2322 Derivatives, or have	already enrolled in th Examination nowledge and skills require as and logical thinking, with	Dec d for attaining all the evidence of origina					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	For BSc Not for enrolled Not for s Y 1s Y A+ to F	Actuarial Science) students only; and students who have passed in STAT4603 Derivatives an in this course; and tudents who have passed in FINA2322 Derivatives, or have at sem Demonstrate thorough mastery at an advanced level of extensive known course learning outcomes. Show strong analytical and critical abilitie thought, and ability to apply knowledge to a wide range of complex	already enrolled in the Examination Examination Towledge and skills require and logical thinking, with familiar and unfamiliar sit d skills required for attaininabilities and logical thinking abilities and logical thinking	d for attaining all the evidence of origina uations. Apply highly g at least most of the land ability to apply					
(and Co-requisites and Impermissible combinations) Offer in 2015 - 2016 Offer in 2016 - 2017 Course Grade	For BSc Not for enrolled Not for s Y 1s Y A+ to F	Actuarial Science) students only; and students who have passed in STAT4603 Derivatives an in this course; and tudents who have passed in FINA2322 Derivatives, or have st sem Demonstrate thorough mastery at an advanced level of extensive known course learning outcomes. Show strong analytical and critical abilities thought, and ability to apply knowledge to a wide range of complex effective organizational and presentational skills. Demonstrate substantial command of a broad range of knowledge an course learning outcomes. Show evidence of analytical and critical as	already enrolled in the Examination Examination Description Descrip	d for attaining all the evidence of origina uations. Apply highly g at least most of the and ability to apply tional skills.					

	outc	ionstrate little or no evidence of commar omes. Lack of analytical and critical abilitie vledge to solve problems. Organization and	es, logical and coherent thinking.	Show very little or no ability to apply
Course Type	Lecture-based c	ourse		
Course Teaching & Learning Activities	Activities		Details	No. of Hours
a Learning Activities	Lectures			36
	Tutorials			12
	Reading / Self s	study		100
Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Assignments	Coursework (assignment tutorials, and a class test)	nts, 25	CLO 1,2,3
	Examination	One 2-hour written examination	n 75	CLO 1,2,3
Required/recommended reading and online materials	McDonald, R. L.	: Derivatives Markets (Addison Wo	esley, 2006, 2nd edition), C	Chapters 1-5, 8.
Course Website	moodle.hku.hk			

STAT3906 Risk theory I (6	credits)				Academic Year	2015	
Offering Department	Statistic	s & Actua	rial Science		Quota		
Course Co-ordinator	Dr K C (Cheung, S	Statistics & Actuarial Science (ke	ccg@hku.hk)			
Teachers Involved	Dr K C (Cheung, S	Statistics & Actuarial Science				
Course Objectives			e of the main topics in actua astic processes to insurance p				
Course Contents & Topics		Severity models; frequency models; collective risk models; coverage modifications; ruin measures; simulation.					
Course Learning Outcomes	On succ	essful cor	mpletion of this course, students	s should be able to:			
	CLO 1		nd the individual risk model and ion of the total claim amounts	d the collective risk	model, evaluate the	distribution and	
	CLO 2		the premium of a policyholder ounts made in previous years	and the total claim a	amounts using the in	nformation of the	
	CLO 3	calculate	some commonly used risk mea	asures and explain th	eir use and limitation	n	
	CLO 4	apply sim	nulation methods within the con	text of actuarial mode	els		
Pre-requisites (and Co-requisites and Impermissible combinations)			3 Stochastic models, or already 3 Probability modelling or MATI				
Offer in 2015 - 2016	Y 2	nd sem			Examination	May	
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	A	course	nstrate thorough mastery at an advance learning outcomes. Show strong analat, and ability to apply knowledge to a ve organizational and presentational sk	ytical and critical abilities wide range of complex, fa	and logical thinking, with	evidence of origina	
	В	course	nstrate substantial command of a broad learning outcomes. Show evidence o edge to familiar and some unfamiliar sit	f analytical and critical abi	ilities and logical thinking	, and ability to apply	
	С	Demonstrate general but incomplete command of knowledge and skills required for attaining most of th learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.					
	D	outcon	nstrate partial but limited command of nes. Show evidence of some coherent ability to apply knowledge to solutational skills.	and logical thinking, but wi	th limited analytical and	critical abilities. Show	
	Fail	outcon	nstrate little or no evidence of commanes. Lack of analytical and critical abilitiedge to solve problems. Organization at	ties, logical and coherent	thinking. Show very little	or no ability to apply	
Course Type	Lecture-	based co	urse				
Course Teaching & Learning Activities	Activit	ies		Details		No. of Hours	
	Lecture	s				36	
	Tutoria	ls				12	
	Readin	g / Self st	udy			100	
	Method		Details				

Assessment Methods and Weighting			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 reading and online materials	Klugman S. A., Inc., 2012, 4th ed	Panjer H. H., & Willmot G. E.: Loss Milition)	Models: From Data to De	ecisions (John Wiley & Sons,
Course Website	moodle.hku.hk			

STAT3907 Linear models a	nd forecasti	ng (6	credits)		Acader	nic Year	2015		
Offering Department	Statistics & A	atistics & Actuarial Science Quota							
Course Co-ordinator	Dr G C S Lui	Or G C S Lui, Statistics & Actuarial Science (csglui@hku.hk)							
Teachers Involved	Dr G C S Lui	, Stati	stics & Actuarial Science						
Course Objectives		his course deals with applied statistical methods of linear models and investigates various forecastin rocedures through using linear models and time series analysis.							
Course Contents & Topics		Regression and multiple linear regression; predicting; generalised linear model; time series mode ncluding autoregressive, moving average, autoregressive-moving average and integrated mode forecasting.							
Course Learning Outcomes	On successfu	ul com	pletion of this course, students s	hould be able to:					
	CLO 1	fit a s	imple or multiple linear regression	n model to real data	a				
	CLO 2 do ANOVA analysis								
	CLO 3 fit a generalized linear model to the real data								
	CLO 4 identify and fit a suitable AR, MA or ARMA model to real data								
	CLO 5 perform residual analysis								
		•	recasting with these fitted models						
(and Co-requisites and Impermissible combinations)	For BSc(Actu Not for stude course; and Not for stude course; and	Not for students who have passed in STAT4601 Time-series analysis, or have already enrolled in course; and Not for students who have passed in ECON2280 Introductory econometrics, or have already enrolle							
Offer in 2015 - 2016	Y 2nd se	em			Examir	nation	May		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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-base	ed cou	rse						
Course Teaching	Activities		1	Details			No. of Hours		
& Learning Activities	Lectures						36		
	Tutorials						12		
	Reading / S	elf stu	dy				100		
Assessment Methods and Weighting	Methods		Details	Weighting in course grade			sment Methods o CLO Mapping		
		Assignments Coursework (assignments,			-				
	Assignment	S	tutorials, and a class test)	3,	25	CLO 1	,2,3,4,5,6		

Required/recommended reading and online materials	R. S. Pindyck & D. L. Rubinfeld: Econometric Models and Economic Forecasts (McGraw-Hill, 1998, 4th edition) Abraham & J. Ledolter: Statistical Methods for Forecasting (John Wiley & Sons, 2005, 2nd edition) G. E. P. Box, G. M. Jenkins & G. Reinsel: Time Series Analysis: Forecasting and Control (Prentice Hall, 1994, 3rd edition)
Course Website	moodle.hku.hk

STAT3908 Credibility theo	ry and loss	distri	butions (6 credits)		Academic Year	2015			
Offering Department	Statistics 8	k Actua	rial Science		Quota				
Course Co-ordinator	Dr K C Che	eung, S	tatistics & Actuarial Science (kc	cg @hku.hk)					
Teachers Involved	Dr K C Che	Dr K C Cheung, Statistics & Actuarial Science							
Course Objectives	calculation a particula	redibility is an example of a statistical estimate. The idea of credibility is very useful in premiu alculation. Insurance loss varies according to the business nature, what distribution should be used to particular loss is both of theoretical interest and practical importance. This course covers importa ctuarial and statistical methods.							
Course Contents & Topics	estimations loss distrib	mited fluctuation approach; Buhlman's approach; Bayesian approach; empirical Bayes paramete stimations; construction and selection of parametric models; properties and estimation of failure time ans distributions, determination of the acceptability of a fitted model; comparison of fitted models mulation of both discrete and continuous random variables.							
Course Learning Outcomes	On succes	sful cor	npletion of this course, students	should be able to:					
	CLO 1 ap	CLO 1 apply limited fluctuation (classical) credibility including criteria for both full and partial c							
	CLO 2 pe	erform I	Bayesian analysis using both dis	crete and continuous	models				
		oply Bu ayesian	hlmann and Buhlmann-Straub i model	models and understa	and the relationship	o of these to the			
	CLO 4 ap	oply cor	njugate priors in Bayesian analys	sis and in particular th	ne Poisson-gamma	model			
	CLO 5 ap	oply em	pirical Bayesian methods in the	nonparametric and se	emiparametric cas	es			
	CLO 6 co	onstruct	and select empirical models						
	CLO 7 de	etermin	e the acceptability of a fitted mod	del and/or compare m	nodels				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in ST	ass in STAT2602 Probability and statistics II or STAT3902 Statistical models or STAT3906 Risk theory I							
Offer in 2015 - 2016	Y 1st s	sem			Examination	Dec			
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	course	edge and skills require nd logical thinking, with niliar and unfamiliar sit	evidence of original					
	В	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at least most of t 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 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								
Course Type	Lecture-ba	sed co	ırse						
Course Teaching	Activities	·		Details		No. of Hours			
& Learning Activities	Lectures					36			
	Tutorials					12			
	Reading /	Self stu	udy			100			
Assessment Methods and Weighting	Methods		Details	Weighting in f		sment Methods to CLO Mapping			
	Assignme	nts	Coursework (assignment tutorials, and a class test)	nts,	25 CLO 1,2,3,4,5				
	Examinati	on	One 3-hour written examination	ı	75 CLO 1	2,3,4,5,6,7			
Required/recommended reading and online materials	Klugman S 2010, 4th 6		anjer H. H., & Willmot G. E.: Lo	ss Models: From Dat	a to Decisions (Jo	hn Wiley & Sons			

Course Website

moodle.hku.hk

STAT3909 Advanced life co	ontingend	ies (6 c	redits)			Academic Year	r 2015			
Offering Department	Statistics	& Actuar	ial Science		(Quota				
Course Co-ordinator	Prof H L	Prof H L Yang, Statistics & Actuarial Science (hlyang@hku.hk)								
Teachers Involved	Prof H L	Prof H L Yang, Statistics & Actuarial Science								
Course Objectives	for Life C	The objective of the course is to prepare students for the Non-traditional Life Insurance parts of the Moofor Life Contingencies (MLC) course of the Society of Actuaries. Emphasis will be placed on applications more advanced theories of life contingencies.								
Course Contents & Topics	Loss-at-is	his course is a continuation of the materials covered in STAT3901. We shall discuss the following oss-at-issue random variable, Benefit premium, Future loss random variable, Benefit reserves, Castrojection, Present value of cash flows, Expenses and asset shares.								
Course Learning Outcomes	On succe	essful con	npletion of this course, students	shou	ld be able to:					
			te expenses in gross premium surances and annuities	calculate policy v	alue based on	the gross premium				
			nd multiple decrement models a decrements	alculate the life ir	nsurances and	annuities in models				
	CLO 3	understaı	nd the multiple state model and	the K	olmogorov forwa	rd equations				
	CLO 4	understaı	nd multiple life models and calc	ulate t	the life insurance	s and annuities	in multi-life models			
	CLO 5 understand the interest risk and calculate the life insurances and annuities when the interest rate is not a constant, and understand profit testing									
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in STAT3901 Life contingencies, or already enrolled in this course; and For BSc(Actuarial Science) students only.								
Offer in 2015 - 2016	Y 2n	d sem	Examination	May						
Offer in 2016 - 2017	Υ				· ·		'			
Course Grade	A+ to F									
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all 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 his effective organizational and presentational skills.					with evidence of origina			
	В	course	learning outcomes. Show evidence of	analyti	nge of knowledge and skills required for attaining at least most of th alytical and critical abilities and logical thinking, and ability to appl ons. Apply effective organizational and presentational skills.					
	C Demonstrate general but incomplete command of knowledge an learning outcomes. Show evidence of some analytical and critica knowledge to most familiar situations. Apply moderately effective or					es and logical think	king, and ability to apply			
	D Demonstrate partial but limited command of knowledge and skills outcomes. Show evidence of some coherent and logical thinking, t limited ability to apply knowledge to solve problems. Apply presentational skills.					limited analytical a	nd critical abilities. Show			
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course le outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to knowledge to solve problems. Organizational and presentational skills are minimally effective or ineffective.						ttle or no ability to apply			
Course Type	Lecture-b	ased cou	ırse							
Course Teaching	Activitie	es		Deta	ails		No. of Hours			
& Learning Activities	Lectures	3					36			
	Tutorials	3					12			
	Reading	/ Self stu	ıdy				100			
Assessment Methods	Method		Details		Weighting in fi		sessment Methods			
. 33	Assignm	nents	Coursework (assignme tutorials, and a class test)	ents,	course grade	` /	to CLO Mapping			
	Examina	ation	One 3-hour written examination	n		75 CL	O 1,2,3,4,5			
Required/recommended reading and online materials	Dickson,	C.M.D.,	I.: Actuarial Mathematics (Socie Hardy, M.R. and Waters, H rsity Press, 2009)	ety of A	Actuaries, 1997, 2 Actuarial Mathe	2nd ed) matics for Life	e Contingent Risk			
		(Cambridge University Press, 2009) moodle.hku.hk								

STAT3910 Financial econor	STAT3910 Financial economics I (6 credits)			
Offering Department	Statistics & Actuarial Science	Quota		
Course Co-ordinator	Prof H L Yang, Statistics & Actuarial Science (hlyang@hku.hk)			
Teachers Involved				

	Lecture II	Lecture notes on conditional expectations and martingale John Hull: Options, Futures and other Derivatives (2008, 7th edition)							
Required/recommended reading			ald: Derivatives Markets (2nd ed						
	Examina	ition	One 3-hour written examination	n		75 CL	O 1,2,3,4,5,6	;	
	Assignm	ents	Coursework (assignme tutorials, and a class test)	nts,		25 CL	O 1,2,3,4,5,6	;	
Assessment Methods and Weighting	Methods	3	Details		Weighting in fir course grade (sessment M to CLO M		
	Reading	/ Self stu	udy					100	
	Tutorials							12	
-	Lectures							36	
Course Teaching & Learning Activities	Activitie			Deta	ails		No. of	f Hours	
Course Type	Lecture-b	ased cou	urse						
	Fail	outcom	nes. Lack of analytical and critical abiliti dge to solve problems. Organization an	ies, log	gical and coherent thin	king. Show very	little or no ability		
	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. Sho 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					es. Shov			
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability knowledge to most familiar situations. Apply moderately effective organizational and presentational skills.								
	course learning outcomes. Show evidence				and range of knowledge and skills required for attaining at least most of the of analytical and critical abilities and logical thinking, and ability to apply situations. Apply effective organizational and presentational skills.				
Grade Descriptors	A	Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for atta course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidency thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. effective organizational and presentational skills.					with evidence of	of origina	
Course Grade	A+ to F								
Offer in 2016 - 2017	Υ								
Offer in 2015 - 2016	Y 1st	Y 1st sem Examination I					Dec		
Pre-requisites and Co-requisites and mpermissible combinations)	Not for s enrolled in	Pass in STAT2602 Probability and statistics II or STAT3902 Statistical models; and Not for students who have passed in STAT4603 Derivatives and risk management, or have alreadenrolled in this course; and Not for students who have passed in FINA2322 Derivatives, or have already enrolled in this course.							
			nd exotic options						
			nd the hedging strategies and p	ortfoli	io, market-maker ı	risk, self-finan	cing portfolio		
		CLO 4 understand the Black-Scholes formula and its assumptions, the option Greeks, option early and implied volatility						asticity	
			nd basic probability theory, ir y, conditional expectation and c				/ariable, con	ditiona	
	CLO 2	understa	nd the risk neutral probability						
	CLO 1 calculate option price using binomial tree								
Course Learning Outcomes			ng; exotic options. npletion of this course, students	shou	uld be able to:	•			
Course Contents & Topics	discrete-t	Option market; European and American options; conditional expectation and discrete-time martinga discrete-time option-pricing theory; binomial model and its Greeks; true probabilities vs. risk-neut probabilities; estimating volatility; the Black-Scholes formula; implied volatility; Greeks again; mark-							
Course Objectives	estimation managem	This course is a basic course on the derivative market. The course covers discrete-time models, volati estimation, and Black-Scholes formula and its variations. The course also includes some basic r management ideas and methods. This course and STAT3911 will cover all the concepts, principles a techniques needed for SoA Exam MFE.							
	Dr J K Wo	oo, Statis	atistics & Actuarial Science stics & Actuarial Science						

STAT3911 Financial ec	Academic Year	2015						
Offering Department	Statistics & Actuarial Science Quota							
Course Co-ordinator	Prof H L Yang, Statistics & Actuarial Science (hlyang@hku.hk)	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. This course and STAT3910 will cover all the concepts principles and techniques needed for SoA Exam MFE.						

Course Contents & Topics	formula; option pr models; c	Brownian motion; introduction to stochastic calculus; arithmetic and geometric Brownian motion; It ormula; Sharpe ratio and risk premium; Black-Scholes equation; risk-neutral stock-price process an option pricing; option's elasticity and volatility; Vasicek, Cox-Ingersoll-Ross, and Black-Derman-To nodels; 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 Outcomes	On succe	ssful cor	mpletion of this course, students	shou	lld be able to:				
	CLO 1	CLO 1 understand Brownian motion and its properties							
	CLO 2	i i							
	CLO 3	CLO 3 understand the Black-Scholes model and option pricing theory							
	CLO 4	unders	stand the delta hedging and som	ne bas	sic risk management i	methods			
	CLO 5	unders	stand some basic interest rate m	nodels	1				
Pre-requisites (and Co-requisites and Impermissible combinations)		ass in MATH3603 Probability theory or STAT3603 Probability modelling or STAT3903 Stochastic model: STAT3910 Financial economics I							
Offer in 2015 - 2016	Y 2nd	sem			Exa	mination	May		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for atta course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. effective organizational and presentational skills.					ith evidence of original		
	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	ased cou	urse						
Course Teaching	Activitie	s		Deta	ails		No. of Hours		
& Learning Activities	Lectures						36		
	Tutorials						12		
	Reading / Self study								
	Reading	Methods Details					100		
Assessment Methods and Weighting			·		Weighting in final course grade (%)	Ass	essment Methods to CLO Mapping		
		3	·	ents,			essment Methods		
	Methods	ents	Details Coursework (assignme		course grade (%)	CL	essment Methods to CLO Mapping		
	Methods Assignm Examina Robert L. John Hull Alison Eth	ents tion McDona Options	Details Coursework (assignme tutorials, and a class test)	ition), s (200 (2002	course grade (%) 25 75 Chapters 20, 21 and 8, 7th edition)	CL CL	essment Methods to CLO Mapping O 1,2,3,4,5		

STAT3951 Advanced conti	ingencies (6 credits)	Academic Year	2015						
Offering Department	Statistics & Actuarial Science Quota								
Course Co-ordinator	Dr E C K Cheung, Statistics & Actuarial Science (eckc@hku.hk)								
Teachers Involved	Dr E C K Cheung, Statistics & Actuarial Science	Dr E C K Cheung, Statistics & Actuarial Science							
Course Objectives	and actuarial techniques used in the field of life and non-life inst	This course serves as a continuation of STAT3909 and extends the coverage to include statistical models and actuarial techniques used in the field of life and non-life insurance. [Students are reminded that this course is a part of the requirement for the exemption from the Subject CT5 Contingencies of the Faculty and Institute of Actuaries, U.K.]							
Course Contents & Topics	Topic covers further analysis of the multiple state model; unit- options; applications of actuarial techniques to a wide range insurance products and valuation of these products. Simple div portfolio.	e of insurance problen	ns. Equity linked						
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 value the cashflow contingent upon more than one risk								

		erstand how to n more than one	use multiple decrem decrement	ent tables to evalu	ate expected cash	nflows dependent				
		erstand the equi ed insurance pro	ty linked insurance p ducts	roducts, and the me	ethod and idea of	valuing the equity				
	CLO 4 und	CLO 4 understand the Esscher transform and its application to option pricing								
	CLO 5 valu	CLO 5 value equity-linked death benefits								
		luate ruin proba dels for non-life ir	abilities and expected asurance	d discounted divide	ends in some sim	ple dividend-ruin				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in STA	rass in STAT3909 Advanced life contingencies; and rass in STAT3910 Financial economics I or already enrolled in this course; and for BSc(Actuarial Science) students only.								
Offer in 2015 - 2016	Y 1st se	m			Examination	Dec				
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors		course learning outo	gh mastery at an advanced omes. Show strong analyti o apply knowledge to a w nal and presentational skills	cal and critical abilities a ide range of complex, fa	and logical thinking, wit	h evidence of original				
		course learning outc	omes. Show evidence of a	inalytical and critical abil	of knowledge and skills required for attaining at least most of th tical and critical abilities and logical thinking, and ability to app s. 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.									
		outcomes. Lack of a	no evidence of comman nalytical and critical abilitie problems. Organization and	s, logical and coherent the	hinking. Show very little	or no ability to apply				
Course Type	Lecture-base	ed course								
Course Teaching	Activities			Details		No. of Hours				
& Learning Activities	Lectures					36				
	Tutorials					12				
	Reading / S	elf study				100				
Assessment Methods	Methods	Details	<u>'</u>	Weighting in		ssment Methods				
and Weighting				course grade	e (%)	to CLO Mapping				
	Assignment	Assignments Coursework tutorials, and		ts,	25 CLO 1,2,3,4,5,6					
	Examination	One 3-hou	ur written examination		75 CLO	1,2,3,4,5,6				
Required/recommended reading and online materials	Dickson, D. CT5 Conting	et al.: Actuarial M encies Core Tec	Mathematics (Society lathematics for Life Countries of Core Reading dinsurance products	ontingent Risks (Car (Institute of Actuarie	mbridge, 2010) s, 2010)					
		ecture notes on equity linked insurance products and simple dividend-ruin models.								

STAT3952 Investment and	asset m	anagement (6 credits)	Academic Year	2015				
Offering Department	Statistic	Statistics & Actuarial Science Quota						
Course Co-ordinator	TBC, St	atistics & Actuarial Science ()						
Teachers Involved	TBC, St	atistics & Actuarial Science						
Course Objectives	commoi tackle p	ne main objective of this course is to introduce students to some of the methods and procedures ommonly used in the management of an investment portfolio. Emphasis will be placed on methods to ckle problems faced by insurance industry such as investment strategy formulation and interest rate risk anagement.						
Course Contents & Topics	actuaria	urse provides an overview on the problems faced by act I concepts to investment practice. This course will cove ment Process, Asset Allocation, Managing Fixed Inc ement.	r the following topic	cs: Investment				
Course Learning Outcomes	_	sessful completion of this course, students should be able to:						
	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	oortfolios					
	CLO 3	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 b	e used to constr	uct an as	set portfolio		
	CLO 6	identify a	nd describe financial and non-fi	nanci	al risks faced by	an entity			
	CLO 7	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	CLO 8 select or build a benchmark for a given portfolio or portfolio management style, descril assess performance measurement methodologies for investment portfolios							
Pre-requisites (and Co-requisites and Impermissible combinations)	For BSc Not for	ss in STAT3901 Life contingencies; and · BSc(Actuarial Science) students only; and t for students who have passed in FINA2320 Investments and portfolio analysis, or have alre rolled in this course.							
Offer in 2015 - 2016	N	Examination							
Offer in 2016 - 2017	N								
Course Grade	A+ to F								
Grade Descriptors	A	A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills require course learning outcomes. Show strong analytical and critical abilities and logical thinking, with thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar sit effective organizational and presentational skills.							
	B Demonstrate substantial command of a broacourse learning outcomes. Show evidence knowledge to familiar and some unfamiliar s				tical and critical abilit	ties and log	gical thinking, a	nd ability to apply	
	learning outcomes. Show evidence of som				mmand of knowledge and skills required for attaining most of the cour orme analytical and critical abilities and logical thinking, and ability to ap- ply moderately effective organizational and presentational skills.				
	outcomes. Show evidence of some coherent				of knowledge and skills required for attaining some of the course learning and logical thinking, but with limited analytical and critical abilities. Show solve problems. Apply limited or barely effective organizational and				
	Fail	outcom	nstrate little or no evidence of comma nes. Lack of analytical and critical abilit edge to solve problems. Organization ar	ies, log	gical and coherent th	inking. Sho	w very little or	no ability to apply	
Course Type	Lecture-	based cou	urse						
Course Teaching	Activiti	es		Details				No. of Hours	
& Learning Activities	Lecture	S						36	
	Tutorials							12	
	Reading / Self study							100	
Assessment Methods and Weighting	Method	ls	Details		Weighting in f			ment Methods CLO Mapping	
	Assignr	nents	Assignments, tutorials/examplesses, group discussion project and presentation			50	CLO 1,2,3,4,5,6,7,8		
	Examin	ation	One 2-hour written examination	n		50	CLO 1,2,3	,4,5,6,7,8	
Required/recommended reading and online materials	Z. Bodie Crouhy, F. J. Fab	, A. Kane Galai, & N oozzi: Har	Fabozzi: Investment Manageme , & A. Marcus: Investments (Mc Mark: Risk Management (2001) adbook of Fixed Income Securiti In Investment Management: An E	Graw es (N	-Hill, 2005, 7th e IcGraw-Hill, 2009	dition) 5, 7th edi		1999)	
Course Website	moodle.l	nku.hk							
Additional Course Information	A Dynan	nic Proces	J. L. Maginn, D.L. Tuttle, J.E. ss (Wiley, 2007, 3rd edition) ability Management of Financial			ey: Mana	aging Invest	ment Portfolios,	

STAT3953 Fundamentals of	actuari	al practice (6 credits)	Academic Year	2015		
Offering Department	Statistic	s & Actuarial Science	Quota			
Course Co-ordinator	Dr L F k	Ng, Statistics & Actuarial Science (flouisng@hku.hk)				
Teachers Involved	Dr L F k	Ng, Statistics & Actuarial Science				
Course Objectives		urse teaches students about the business environment and is using the actuarial control cycle as a framework.	exposes them to pra	actical real-world		
Course Contents & Topics	Profess Solution individua	urse provides an overview on selected materials relating onal Actuary, External Forces, Risk in Actuarial Problet s. Emphasis will be placed on applications to various fin al life insurance, group insurance, social security plans, rev. & casualty insurance.	ns, Design and Prici ancial security progra	ing of Actuarial mmes including		
Course Learning Outcomes	On succ	essful completion of this course, students should be able to:				
	CLO 1 provide introductory description of financial security systems, common actuarial techniques a practical experiences CLO 2					

		describe a	actuarial practices, principles	, аррі	roaches, methods	comn	nonalities	, problems and
	CLO 3	explain ac	tuarial practices across the tra	ditiona	al areas of practice			
	CLO 4		tuarial practices as applied di	rectly	on behalf of finance	ial sec	curity syst	tem providers or
	CLO 5	apply actu	arial skills in nontraditional and	d eme	rging areas of prac	tice		
	CLO 6	provide co	ntext for the specific mathema	atical a	and technical skills	develo	ped in th	e basic actuarial
	CLO 7	prepare fo	r the professional role as an A	ssocia	ate of the Society of	Actua	ries	
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in STAT3909 Advanced life contingencies; and For BSc(Actuarial Science) students only.						
Offer in 2015 - 2016	Y 1:	st sem			Exa	aminat	ion	No Exam
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F							
Grade Descriptors	A	course I thought,	trate thorough mastery at an advance earning outcomes. Show strong analy and ability to apply knowledge to a organizational and presentational ski	ytical ar wide ra	nd critical abilities and I	ogical th	inking, with	evidence of original
	В	· ·						and ability to apply
	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 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. Organizational and presentational skills are minimally effective or ineffective.							
Course Type	Lecture-	based cou	se					
Course Teaching	Activit	ies		Deta	ils			No. of Hours
& Learning Activities	Lecture	es						36
	Project	work						12
	Readin	g / Self stud	dy					100
Assessment Methods and Weighting	Method	ds	Details		Weighting in fir			sment Methods o CLO Mapping
	Presen	tation	oral presentation			` '		O 4,5,6
		reports	written report			50) 4,5,6,7
	Test	•	in-class quizzes					
Required/recommended reading and online materials	Bellis, C Control Brown, Insurance	Klugman, S.: Understanding Actuarial Practice (Society of Actuaries, 2012) Bellis, C., Klugman, S., Shepherd, J., and Lyon, R.: Understanding Actuarial Management: The Control Cycle (Institute of Actuaries of Australia, 2010, 2nd ed.) Brown, R.L. and Gottlieb, L.R.: Introduction to Ratemaking and Loss Reserving for Property and Insurance (ACTEX Publications, Inc., 2007, 3rd ed.) Segal, S.: Corporate Value of Enterprise Risk Management: The Next Step in Business Mar						erty and Casualty
Course Website	, ,							
	module.	noodle.hku.hk						

STAT3954 Current topics	in actuarial science (6 credits)	Academic Year	2015				
Offering Department	Statistics & Actuarial Science	I Science Quota					
Course Co-ordinator	Prof W K Li, Statistics & Actuarial Science (hrntlwk@hku.hk)						
Teachers Involved	Mr Simon Lam, Mr Fred Choi & Mr Henry Cheung, Statistics & Actuarial Science						
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 will benefit students in their coming future career.						
Course Contents & Topics	This course covers a full range of topics related to both areas including 1 Actuaries' Legal Thinking. For Practical Actuarial Practice: It covers the major practical topics in bo Insurance, it covers the full picture of actuarial control cycle including F Reporting and Experience Analysis. For General Insurance, it covers the Pricing and Valuation. For Actuaries' Legal Thinking: This is the 7th year of the course and the	th Life and Casualty Product Pricing, Value backbone areas in	/ areas. For Life uation, Financial acluding Product				

	stimulation would do	hoing changes in the market for basic legal and general insurance skills for actuaries. Int mulating recent legal materials with heavy involvement of actuarial and other general insurance ould dominate the course, alongside with basic legal research skills and fundamental legal thinking experience from guests from the General Insurance Industry would also infiltrate the course.							
Course Learning Outcomes	On succ	essful com	pletion of this course, students sho	ould be able to:					
	CLO 1	have a basic understanding regarding Actuarial Control Cycle from A to Z for Life Insurance and General Insurance							
	CLO 2	CLO 2 possess some experience regarding fundamental actuarial practice through practical project							
	CLO 3	possess b	pasic understanding of the legal sys	stem in Hong Kong					
	CLO 4	possess flaw of tort	fundamental knowledge in certain	core legal aspects such	as the law	of contract and the			
	CLO 5	possess f	undamental knowledge of the law	of insurance					
	CLO 6	conduct e	lementary legal researches when f	acing with legal problems	5				
	CLO 7	understar	nd the basic elements of a routine ju	udgment, the matrix of the	e facts and t	he law involved			
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	STAT3909	Life contingencies, or already end Advanced life contingencies, or al Science) students only.		ırse); and				
Offer in 2015 - 2016	N			Exa	amination				
Offer in 2016 - 2017	N								
Course Grade	A+ to F								
Grade Descriptors	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	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	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	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 cou	rse						
Course Teaching	Activiti	es		Details		No. of Hours			
& Learning Activities	Lecture	S				36			
	Tutorial	S				12			
	Reading	g / Self stu	dy			100			
Assessment Methods and Weighting	Method	ls	Details	Weighting in final course grade (%)	Ass	essment Methods to CLO Mapping			
	Assignn	nents	Coursework (assignments practical project & class test(s))	100	CLO ²	1,2,3,4,5,6,7			
Course Website	moodle.h	nku.hk							

STAT3955 Survival analysis	s (6 credits)	Academic Year	2015			
Offering Department	Statistics & Actuarial Science	Quota				
Course Co-ordinator	Dr J F Xu, Statistics & Actuarial Science (saas@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 reversed include: the introduction of some important basic quantities I function; some commonly used parametric survival models; conceparametric estimation of the survival distribution by maximum likelihoo estimation of the survival functions from possibly censored sample estimator, the Nelson-Aalen estimator; and the kernel density estimated comparisons of k independent survival functions by means of the regression models; Cox's semiparametric proportional hazards regressionallysis.	ike the hazard function into of censoring and id estimation method; es by means of the iter or the Ramlau-Ha generalized log-rank	on and survival d/or truncation; nonparametric Kaplan-Meier insen estimator test; parametric			
Course Learning Outcomes	On successful completion of this course, students should be able to:					

		uire a clear understanding of the nature concept of death and life	ire or failure time data or st	urvivai data, a generalization					
		CLO 2 perform estimation for some commonly used survival models under different types of censoring mechanisms							
	CLO 3 anal	yze survival data using the Cox's sen	niparametric proportional ha	zards model					
	CLO 4 exte	and the Cox's model to a multivariate s	setup to accommodate multi	ivariate survival data					
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in STAT3902 Statistical models, or already enrolled in this course; or Pass in STAT3600 Linear statistical analysis or STAT3901 Life contingencies							
Offer in 2015 - 2016	Y 2nd se	em	Exam	ination May					
Offer in 2016 - 2017	Υ		'	'					
Course Grade	A+ to F								
Grade Descriptors	t	Demonstrate thorough mastery at an advance course learning outcomes. Show strong analythought, and ability to apply knowledge to a waffective organizational and presentational skill:	ical and critical abilities and logicatide range of complex, familiar and	al thinking, with evidence of original					
	-	Demonstrate substantial command of a broad recourse learning outcomes. Show evidence of a knowledge to familiar and some unfamiliar situa	analytical and critical abilities and	logical thinking, and 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.							
	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.								
		outcomes. Show evidence of some coherent ar imited ability to apply knowledge to solve	nd logical thinking, but with limited a	analytical and critical abilities. Show					
	Fail [outcomes. Show evidence of some coherent ar imited ability to apply knowledge to solve	nd logical thinking, but with limited as problems. Apply limited or band of knowledge and skills require as, logical and coherent thinking. S	analytical and critical abilities. Show arely effective organizational and ad for attaining the course learning show very little or no ability to apply					
Course Type	Fail [outcomes. Show evidence of some coherent ar imited ability to apply knowledge to solve presentational skills. Demonstrate little or no evidence of comman outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and	nd logical thinking, but with limited as problems. Apply limited or band of knowledge and skills require as, logical and coherent thinking. S	analytical and critical abilities. Show arely effective organizational and ad for attaining the course learning show very little or no ability to apply					
Course Teaching	Fail [outcomes. Show evidence of some coherent ar imited ability to apply knowledge to solve presentational skills. Demonstrate little or no evidence of comman outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and	nd logical thinking, but with limited as problems. Apply limited or band of knowledge and skills require as, logical and coherent thinking. S	analytical and critical abilities. Show arely effective organizational and ad for attaining the course learning show very little or no ability to apply					
Course Teaching	Fail [outcomes. Show evidence of some coherent ar imited ability to apply knowledge to solve presentational skills. Demonstrate little or no evidence of comman outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and	nd logical thinking, but with limited a problems. Apply limited or be done of the problems of the problems of the problems. Apply limited or be done of the problems, logical and coherent thinking. So presentational skills are minimally	analytical and critical abilities. Show arely effective organizational and ed for attaining the course learning show very little or no ability to apply effective or ineffective.					
Course Type Course Teaching & Learning Activities	Fail [] Lecture-base	outcomes. Show evidence of some coherent ar imited ability to apply knowledge to solve presentational skills. Demonstrate little or no evidence of comman outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and	nd logical thinking, but with limited a problems. Apply limited or be done of the problems of the problems of the problems. Apply limited or be done of the problems, logical and coherent thinking. So presentational skills are minimally	analytical and critical abilities. Show arely effective organizational and add for attaining the course learning show very little or no ability to apply reffective or ineffective. No. of Hours					
Course Teaching	Fail Lecture-base Activities Lectures	outcomes. Show evidence of some coherent ar imited ability to apply knowledge to solve presentational skills. Demonstrate little or no evidence of comman outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and ad course	nd logical thinking, but with limited a problems. Apply limited or be done of the problems of the problems of the problems. Apply limited or be done of the problems, logical and coherent thinking. So presentational skills are minimally	analytical and critical abilities. Show arely effective organizational and ed for attaining the course learning show very little or no ability to apply effective or ineffective. No. of Hours					
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-base Activities Lectures Tutorials	outcomes. Show evidence of some coherent ar imited ability to apply knowledge to solve presentational skills. Demonstrate little or no evidence of comman outcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and ad course	nd logical thinking, but with limited a problems. Apply limited or be done of the problems of the problems of the problems. Apply limited or be done of the problems, logical and coherent thinking. So presentational skills are minimally	analytical and critical abilities. Show arely effective organizational and and for attaining the course learning show very little or no ability to apply effective or ineffective. No. of Hours 36					
Course Teaching & Learning Activities Assessment Methods	Fail Lecture-base Activities Lectures Tutorials Reading / Se	putcomes. Show evidence of some coherent arimited ability to apply knowledge to solve presentational skills. Demonstrate little or no evidence of comman putcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and did course elf study Details Coursework (assignment)	and logical thinking, but with limited as problems. Apply limited or be problems. Apply limited or be do of knowledge and skills require is, logical and coherent thinking. So presentational skills are minimally presented in the skills are	analytical and critical abilities. Show arely effective organizational and and fed for attaining the course learning show very little or no ability to apply a effective or ineffective. No. of Hours 36					
Course Teaching & Learning Activities	Fail Lecture-base Activities Lectures Tutorials Reading / So Methods	putcomes. Show evidence of some coherent arimited ability to apply knowledge to solve presentational skills. Demonstrate little or no evidence of comman putcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and did course Details Coursework (assignmen tutorials, and a class test)	d logical thinking, but with limited as problems. Apply limited or be problems. Apply limited or be do of knowledge and skills require as, logical and coherent thinking. So presentational skills are minimally presented by the skills are m	analytical and critical abilities. Show arely effective organizational and and fed for attaining the course learning show very little or no ability to apply a effective or ineffective. No. of Hours 36 12 100 Assessment Methods to CLO Mapping					
Course Teaching & Learning Activities	Fail Lecture-base Activities Lectures Tutorials Reading / So Methods Assignments Examination Cox, D. R. ar Hosmer, D. V. (Wiley, 1999) Klein, J. P. a	putcomes. Show evidence of some coherent arimited ability to apply knowledge to solve proseentational skills. Demonstrate little or no evidence of comman putcomes. Lack of analytical and critical abilitie knowledge to solve problems. Organization and docurse Details Coursework (assignment tutorials, and a class test) One 3-hour written examination and Oakes, D.: Analysis of Survival Dat W. and Lemeshow, S.: Applied Survival Part of Survival Dat W. and Lemeshow, S.: Applied Survival Part of Survival Part V. and Lemeshow, S.: Applied Survival Part of Survival Part V. and Lemeshow, S.: Applied Survival Part of Survival Part V. and Lemeshow, S.: Applied Survival Part of Survival Part V. and Lemeshow, S.: Applied Survival Part of Survival Part V. and Lemeshow, S.: Applied Survival Part of Survival Part V. and Lemeshow, S.: Applied Survival Part Octobre Part of Survival Part V. and Lemeshow, S.: Applied Survival Part V. and V. a	d logical thinking, but with limited as problems. Apply limited or be problems. Apply limited or be do of knowledge and skills require as, logical and coherent thinking. So presentational skills are minimally p	analytical and critical abilities. Show arely effective organizational and and fed for attaining the course learning show very little or no ability to apply a effective or ineffective. No. of Hours					

STAT3956 Pension funds	and pensi	n mathematics (6 credits	s)	Academic Year	2015			
Offering Department	Statistics	Statistics & Actuarial Science Quota						
Course Co-ordinator	Prof G M	, Statistics & Actuarial Science	e (gma328@hku.hk)					
Teachers Involved	Prof G M	, Statistics & Actuarial Science	9					
Course Objectives	fundame	is course covers the basics of pension plan design and pension fund management, as well as the ndamentals of pension plan valuations using different actuarial cost methods. The students will be roduced to the application of actuarial valuation techniques to the funding and accounting of pension ans.						
Course Contents & Topics	pension	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 Outcomes	On succe	ssful completion of this course,	students should be able to:					
	CLO 1	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 STAT390	99 Advanced life contingencies						
Offer in 2015 - 2016	Y 1st sem		E	Examination	Dec			
Offer in 2016 - 2017	Υ	Υ						
Course Grade	A+ to F	A+ to F						
Grade Descriptors	cours	onstrate thorough mastery at an advanced e learning outcomes. Show strong analyti ht, and ability to apply knowledge to a wi ive organizational and presentational skills	ical and critical abilities an ide range of complex, fam	d logical thinking, wi	th evidence of original			
	cours	onstrate substantial command of a broad ra e learning outcomes. Show evidence of a edge to familiar and some unfamiliar situa	analytical and critical abilitie	es and logical thinkir	ng, and ability to apply			
	learni	onstrate general but incomplete commanding outcomes. Show evidence of some are edge to most familiar situations. Apply mo	nalytical and critical abilitie	es and logical thinkin	g, and ability to apply			
	outco	onstrate partial but limited command of kn mes. Show evidence of some coherent an d ability to apply knowledge to solve ntational skills.	d logical thinking, but with	limited analytical and	critical abilities. Show			
	outco	onstrate little or no evidence of command mes. Lack of analytical and critical abilitie edge to solve problems. Organization and	s, logical and coherent thir	nking. Show very littl	e or no ability to apply			
Course Type	Lecture-based co	ourse						
Course Teaching	Activities		Details		No. of Hours			
& Learning Activities	Lectures				36			
	Tutorials				12			
	Reading / Self st	tudy		100				
Assessment Methods and Weighting	Methods	Details	Weighting in fi		ssment Methods to CLO Mapping			
	Assignments	Coursework (assignmen tutorials, and a class test)	its,	25 CLO	1,2,3,4,5,6			
	Examination	One 3-hour written examination		75 CLC	1,2,3,4,6			
Required/recommended reading and online materials	McGill, D.M., Briedition) William H. Aitken Morneau Sobeco Actuarial Standa Obligations Actuarial Standal Measuring Pensic Actuarial Standal Valuations David Farber, AS Actuarial Cost Mc 2001 Supplemen Ma C M George	con: Pension Mathematics for Actuown, K.N., Haley, J.J., Schieber: Problem-Solving Approach to Per: Handbook of Canadian Pension and of Practice No. 27, Selection of con Obligations and of Practice No. 44, Selection of No. 44, Selection of Practice No. 44, Selection of No. 44, Selection of Practice No. 44, Selection of No. 44, S	er, S.J.: Fundamenta ension Funding and V & Benefit Plans (2006 on of Economic Ass f Demographic and O on and Use of Asse d, FSPA, Duane May 19, ACTEX Publication view, ACTEX Publication	als of Private Perfaluation, (2nd ed 8, 14th Edition) sumptions for Muther Noneconomet Valuation Meyer, MSPA, Geons tions	lition). Ileasuring Pension ic Assumptions for thods for Pension rge Matray, FSPA:			
Course Website	(2015) moodle.hku.hk							
Jourge Hendite	oodio.iiku.iik							

STAT4601 Time-series and	ılysis (6 d	credits)	Academic Year	2015				
Offering Department	Statistic	Statistics & Actuarial Science Quota						
Course Co-ordinator	Dr G Li,	Statistics & Actuarial Science (gdli@hku.hk)						
Teachers Involved	Dr G Li,	Statistics & Actuarial Science						
Course Objectives	naturally observa this. Th process	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		arity and the autocorrelation functions; linear stationary models ation; estimation and diagnostic checking; seasonal models	·	•				
Course Learning Outcomes	On succ	sessful completion of this course, students should be able to:						
	CLO 1	CLO 1 recognize a stationary vs non-stationary time series						
	CLO 2	CLO 2 understand some basic properties of commonly used time series models such as AF (autoregressive), MA (moving average) and ARMA models						

	CLO 4 ider	ntify di	fferent time series models base	d on	autocorrelation fur	nctions			
	CLO 5 fit a		ble AR, MA or ARMA model to				ming to statio	narity if	
			oodness of fit tests for such mo	dels					
			sting with these fitted time serie						
Pre-requisites (and Co-requisites and Impermissible combinations)	Not for stud course; and	Not for students who have passed in STAT3907 Linear models and forecasting, or have already enrolled							
Offer in 2015 - 2016	Y 1st se	m 2	nd sem		E	xamination	Dec	May	
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors		course thought effectiv	strate thorough mastery at an advance learning outcomes. Show strong analy t, and ability to apply knowledge to a v e organizational and presentational skil	tical a vide ra ls.	and critical abilities and ange of complex, famil	logical thinking iar and unfamili	, with evidence of ar situations. Ap	of original oly highly	
		course	strate substantial command of a broad learning outcomes. Show evidence of dge to familiar and some unfamiliar situ	analy	tical and critical abilitie	s and logical thi	inking, and 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.							
		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-base	ed cou	ırse						
Course Teaching	Activities			Det	ails		No. of	Hours	
& Learning Activities	Lectures							36	
	Tutorials							12	
	Reading / S	Self stu	ıdy					100	
Assessment Methods and Weighting	Methods		Details		Weighting in fin		ssessment M to CLO M		
	Assignment	ts	Coursework (assignme tutorials, and a class test)	nts,		40 CL	CLO 1,2,3,4,5,6,7		
	Examination	n	One 2-hour written examination	n	(60 C	LO 1,2,3,4,6,7	7	
Required/recommended reading and online materials	Bovas Ábrah edition) W. W .S. W edition) W. K. Li: Dia	ham & /ei: Ti ignost	Chan: Time Series Analysis wit Johannes Ledolter: Statistical me Series Analysis: Univariate ic Checks in Time Series (Chap-linear Time Series: A Dynamical	Meth and man	nods for Forecasting Multivariate Methall/CRC, 2004	ng (John Wild nods (Addisc)	ey & Sons, 20 on-Wesley, 20	006, 2nd	
Course Website	moodle.hku.l			- ,			,	/	
· · · · ·									

STAT4602 Multivariate dat	a analysis (6 credits)	Academic Year	2015		
Offering Department	Statistics & Actuarial Science Quota 50				
Course Co-ordinator	Prof T W K Fung, Statistics & Actuarial 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 often 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-on experience with the statistical software SAS.				
Course Contents & Topics	Problems with multivariate data. Multivariate normality and tr sample. Tests of covariance matrix. Correlations: Simple, partial, regression. Principal components analysis. Factor analysis. Factor analysis. Factor analysis of variance. Discriminant analys model.	multiple and canon Problems for mea	ical. Multivariate ns of several		
Course Learning Outcomes	On successful completion of this course, students should be able to: CLO 1				

premissible combinations) Offer in 2015 - 2016 Y 2nd sem PA + 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 effective organizational and presentational skills. B Demonstrate substantial command of an presentational skills. B Demonstrate substantial command of a presentational skills. C Demonstrate partial but limited command of a forward part of skills. C Demonstrate personal but incomplete command of a forward partial skills required for attaining most of the course learning outcomes. Show wetfaces of some analytical and critical abilities and logical thinking, and skills required for attaining most of the course learning outcomes. Show wetfaces of some analytical and critical abilities. Show the strong and skills required for attaining most of the course learning outcomes. Show wetfaces of some analytical and critical abilities and logical thinking, and skills required for attaining most of the course learning outcomes. Show wetfaces of some analytical and critical abilities and logical thinking, and skills required for attaining most of the course learning outcomes. Show wetfaces of some analytical and critical abilities and logical thinking, and adalytic apport worked to the strong analytical and critical abilities. Show the strong analytical and critical abilities and logical thinking, and a formation of some analytical and critical abilities. Show the strong and ability to apply to the strong analytical and critical abilities. Show the strong analytical and critical abilities. Show and a skills required for attaining and an adalytical critical abilities. Show and a skills required for attaining and an adalytical properties of the course learning outcomes. Show welfaces of some of the course learning outcomes. Show welfaces of some of course do course the strong analytical and critical abilities. Show anal			CORR, I	multivariate data with main SAS PROC CANCORR, PROC PR C and etc					
canonical correlation and multivariate regression explore the latent linear structure of a data set with multiple measurements by principal components analysis and factor analysis									
CLO 5 classify observations of a population with one or more than one measurements by discriminant analysis classify observations of a population with one or more than one measurements by discriminant analysis classify observations of a population with one or more than one measurements by discriminant analysis (and Co-requisites and impermissible combinations) Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting (and Co-requisites and impermissible combinations) Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting (and Co-requisites and page 2017 Price 10		CLO 3				variables by mu	ltiple, partial and		
Pere-requisites Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting Pass in STAT3907 Linear models Pass in State m		CLO 4			a data set with multi	iple measureme	ents by principal		
promissible combinations) Differ in 2015 - 2016 Y 2nd sem A+ to F A Demonstrate thorough mastery at an advanced level of extensive knowledge and skills required for attaining all the course learning ductomes. Store storing analytical and critical abilities and logical thinking, with evidence of original effective organizational and presentational skills. B Demonstrate substantial command of a broad range of complex, familiar situations. Apply highly deflowed organizational and presentational skills. B Demonstrate substantial command of a broad range of complex, familiar and some unfamiliar and some unfamiliar and some unfamiliar situations. Apply highly effective 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 skills, opport with the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and skills required for attaining most of the course learning outcomes. Show evidence of some analytical and critical abilities. Provided and critical abilities and presentational skills. Fail Demonstrate partial but limited command of knowledge and skills required for attaining some of the course learning outcomes. Show evidence of some analytical and critical abilities. Provided and cr		CLO 5	,	observations of a population with	one or more than on	e measurement	s by discriminant		
Ourse Grade 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 peneral but incomplete command of thouselege and skills required for attaining and ability to apply knowledge to familiar and some unfamiliar situations. Apply effective organizational and presentational skills. D Demonstrate peneral but incomplete command of thouselege and skills required for attaining and ability to apply knowledge and skills required for attaining and ability to apply knowledge to solve problems. Apply intended or better than the post thinking, but with limited ability to apply knowledge to solve problems. Apply intended ability to apply knowledge to solve problems. Apply intended or the presentational skills. Fail Demonstrate little or no avidence of command of knowledge and skills required for attaining the course learning outcomes. Lack of analytical and critical abilities, glob and presentational skills are minimally effective or ineffective. Course Type Course Type Lecture-based course Course Teaching & Lecture-based course Activities Details No. of Hours Lectures 3 36 Tutorials 12 Reading / Self study 100 Assessment Methods and Weighting in final course grade (%) Lectures 3 56 CLO 1,2,3,4,5 Examination One 3-hour written examination 50 CLO 1,2,3,4,5 Examination One 3-hour written examination	Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	Pass in STAT3600 Linear statistical analysis or STAT3907 Linear models and forecasting						
A+ to F Grade Descriptors 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 the object of the course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original the output, and ability to apply knowledge to a wide 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 mustimalize attainations. 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 effective organizational and presentational skills. D Demonstrate general but incomplete command of knowledge and skills required for attaining most of the course learning outcomes. Show evidence of some content and logical thinking, and ability to apply knowledge to most familiar situations. Apply inclined or barrely 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. Lack of analytical and critical abilities, hopping the problems. Department of the course and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and presentational skills. Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining most of the course demonstrate the service of the course of the course of the course demonstrate the service of the presentational skills. Fail Demonstrate little or no evidence of command of knowledge and sk	Offer in 2015 - 2016	Y 2	nd sem		E	xamination	May		
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 compliant instructions. Apply highly effective organizational and presentational skills. B	Offer in 2016 - 2017	Υ							
course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of original trought, 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 termiliar and some unfamiliar situations. Apply effective organizational and presentational skills. D 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 skillstensions. Apply moderately effective arganizational 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 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 some of the course learning outcomes. Show evidence of some coherent and logical thinking. Show very little or no ability to apply knowledge to solve problems. Organization 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 some of the course presentational skills. Fail Demonstrate little or no evidence of c	Course Grade	A+ to F							
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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 and presentational and presentational and presentational and presentational and presentational ability to apply 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 mimited ability to apply knowledge to solve problems. Apply limited or barely effective organizational and presentational skills. Fail		В	B Demonstrate substantial command of a broad range of knowledge and skills required for attaining at lea course learning outcomes. Show evidence of analytical and critical abilities and logical thinking, and a						
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Activities Activities		Fail	outcom	nes. Lack of analytical and critical abilitie	es, logical and coherent think	king. Show very little	or no ability to apply		
Lectures 36 Tutorials 12 Reading / Self study 100 Assessment Methods and Weighting	Course Type	Lecture-	-based cou	urse					
Lectures 36 Tutorials 12 Reading / Self study 100 Assessment Methods and Weighting	Course Teaching	Activit	ies		Details		No. of Hours		
Reading / Self study Methods Assessment Methods and Weighting Methods Details Weighting in final course grade (%) Assignments Coursework (assignments, tutorials, and a class test) Examination One 3-hour written examination Coursework (assignments, tutorials, and a class test) Examination One 3-hour written examination Coursework (assignments, tutorials, and a class test) Examination One 3-hour written examination Details CLO 1,2,3,4,5 CLO 1,2,3,4,5 Assessment Methods to CLO Mapping CLO 1,2,3,4,5 CLO 1,2,3,4,5 Assessment Methods to CLO Mapping CLO 1,2,3,4,5 Details Assessment Methods to CLO Mapping Assignments CLO 1,2,3,4,5 CLO 1,2,3,4,5 Details Assessment Methods to CLO Mapping CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping Assignments, to CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping Assignments, to CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping Assignments, to CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping Assignments, to CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping Assignments, to CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping Assignments, to CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO Mapping Assessment Methods to CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO 1,2,3,4,5 Lamination Details Assessment Methods to CLO 1,2,3,4,5 Lamination Details Assessment Methods	& Learning Activities	Lecture	es				36		
Assessment Methods and Weighting Methods Details Weighting in final course grade (%) Assignments Coursework (assignments, tutorials, and a class test) Examination One 3-hour written examination To CLO 1,2,3,4,5 Separate Analysis (Prentice-Hall, 2007, 6th edition) Mardia K. V., Kent J. T., and Bibby J. M.: Multivariate Analysis (Academic Press, 1979) Seber G. A. F.: Multivariate Observations (John Wiley & Sons, 1984) Morrison D. F.: Multivariate Statistical Methods (McGraw-Hill, 1990, 3rd ed.) Hair J. F., Anderson R. E., Tatham R. L., & Black W. C.: Multivariate Data Analysis (Prentice-Hall, 2006, 6th edition) Srivastava M. S.: Methods of Multivariate Statistics (John Wiley and Sons, 2002) SAS Manuals on-line: Use the HELP button.		Tutoria	ls				12		
Assignments Coursework (assignments, tutorials, and a class test) Examination One 3-hour written examination Seber G. A. F.: Multivariate Observations (John Wiley & Sons, 1984) Morrison D. F.: Multivariate Statistical Methods (McGraw-Hill, 1990, 3rd ed.) Hair J. F., Anderson R. E., Tatham R. L., & Black W. C.: Multivariate Data Analysis (Prentice-Hall, 2006, 6th edition) Srivastava M. S.: Methods of Multivariate Statistics (John Wiley and Sons, 2002) SAS Manuals on-line: Use the HELP button.		Readin	ıg / Self stı	udy			100		
Assignments tutorials, and a class test) Examination One 3-hour written examination So CLO 1,2,3,4,5 CLO 1,2,3,4,5 CLO 1,2,3,4,5 Donnson, R. A. & Wichern, D. W.: Applied Multivariate Statistical Analysis (Prentice-Hall, 2007, 6th edition) Mardia K. V., Kent J. T., and Bibby J. M.: Multivariate Analysis (Academic Press, 1979) Seber G. A. F.: Multivariate Observations (John Wiley & Sons, 1984) Morrison D. F.: Multivariate Statistical Methods (McGraw-Hill, 1990, 3rd ed.) Hair J. F., Anderson R. E., Tatham R. L., & Black W. C.: Multivariate Data Analysis (Prentice-Hall, 2006, 6th edition) Srivastava M. S.: Methods of Multivariate Statistics (John Wiley and Sons, 2002) SAS Manuals on-line: Use the HELP button.	Assessment Methods and Weighting	Method	ds	Details					
Johnson, R. A. & Wichern, D. W.: Applied Multivariate Statistical Analysis (Prentice-Hall, 2007, 6th edition) Mardia K. V., Kent J. T., and Bibby J. M.: Multivariate Analysis (Academic Press, 1979) Seber G. A. F.: Multivariate Observations (John Wiley & Sons, 1984) Morrison D. F.: Multivariate Statistical Methods (McGraw-Hill, 1990, 3rd ed.) Hair J. F., Anderson R. E., Tatham R. L., & Black W. C.: Multivariate Data Analysis (Prentice-Hall, 2006, 6th edition) Srivastava M. S.: Methods of Multivariate Statistics (John Wiley and Sons, 2002) SAS Manuals on-line: Use the HELP button.		Assign	ments	, ,	nts		1,2,3,4,5		
Mardia K. V., Kent J. T., and Bibby J. M.: Multivariate Analysis (Académic Press, 1979) Seber G. A. F.: Multivariate Observations (John Wiley & Sons, 1984) Morrison D. F.: Multivariate Statistical Methods (McGraw-Hill, 1990, 3rd ed.) Hair J. F., Anderson R. E., Tatham R. L., & Black W. C.: Multivariate Data Analysis (Prentice-Hall, 2006, 6th edition) Srivastava M. S.: Methods of Multivariate Statistics (John Wiley and Sons, 2002) SAS Manuals on-line: Use the HELP button.		Examination		One 3-hour written examination	1 5	50 CLO	1,2,3,4,5		
	Required/recommended reading and online materials	Mardia I Seber G Morrison Hair J. I 6th editi Srivasta	Johnson, R. A. & Wichern, D. W.: Applied Multivariate Statistical Analysis (Prentice-Hall, 2007, 6th e Mardia K. V., Kent J. T., and Bibby J. M.: Multivariate Analysis (Academic Press, 1979) Seber G. A. F.: Multivariate Observations (John Wiley & Sons, 1984) Morrison D. F.: Multivariate Statistical Methods (McGraw-Hill, 1990, 3rd ed.) Hair J. F., Anderson R. E., Tatham R. L., & Black W. C.: Multivariate Data Analysis (Prentice-Hall 6th edition) Srivastava M. S.: Methods of Multivariate Statistics (John Wiley and Sons, 2002)						
ALLUMI TURNOUT TO THE PROPERTY OF THE PROPERTY	Course Website	+							

STAT4603 Current topics i	in risk ma	nagement (6 credits)	Academic Year	2015
Offering Department	Statistics	& Actuarial Science	Quota	
Course Co-ordinator	TBC, Sta	tistics & Actuarial Science ()		
Teachers Involved				
Course Objectives	manager	se is to broaden the students knowledge of risk man nent. These topics will build on the theory and meth ach year depend on staff availability.		
Course Contents & Topics		risk; BASEL III and beyond; Operational risk; Mns in risk management.	lodel risk; Cutting edge ris	sk analytics and
Course Learning Outcomes	On succe	essful completion of this course, students should be a	ble to:	
	CLO 1	gain insights into current advances in risk managem	nent	
	CLO 2	understand current risk management pitfalls and de	velopment	

	CLO 3	make c	ffective use of models and tech	riique	es for managing va	illous Killus	OI IISK	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	Pass in STAT4601 Time-series analysis						
Offer in 2015 - 2016	N	Examination						
Offer in 2016 - 2017	N							
Course Grade	A+ to F	- to F						
Grade Descriptors	A	course	istrate thorough mastery at an advance learning outcomes. Show strong analy t, and ability to apply knowledge to a re organizational and presentational ski	ytical a wide r	and critical abilities and	d logical thinki	ing, with e	evidence of original
	В	course	strate substantial command of a broad learning outcomes. Show evidence of dge to familiar and some unfamiliar situ	analy	tical and critical abilitie	es and logical	thinking,	and ability to apply
	С	learnin	strate general but incomplete comma g outcomes. Show evidence of some dge to most familiar situations. Apply m	analyt	ical and critical abilitie	s and logical	thinking,	and ability to apply
	D							tical abilities. Show
	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.						
								r no ability to apply
Course Type	Lecture-ba	knowle	dge to solve problems. Organization ar					r no ability to apply
Course Teaching	Lecture-ba	knowle ased cou	dge to solve problems. Organization ar	nd pres				r no ability to apply
•		knowle ased cou	dge to solve problems. Organization ar	nd pres	sentational skills are mi			r no ability to apply fective.
Course Teaching	Activities	knowle ased cou	dge to solve problems. Organization ar	nd pres	sentational skills are mi			r no ability to apply fective.
Course Teaching	Activities Lectures	knowle ased cou s	dge to solve problems. Organization ar	nd pres	sentational skills are mi			r no ability to apply fective. No. of Hours
Course Teaching	Activities Lectures Tutorials	knowle ased cou s	dge to solve problems. Organization ar	nd pres	sentational skills are mi	nimally effecti	Assess	n no ability to apply fective. No. of Hours 36 12
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Tutorials Reading	knowle ased cou	dge to solve problems. Organization ar urse	Det	ails Weighting in fir	nimally effecti	Assess to	No. of Hours 36 12 100 ment Methods
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Tutorials Reading	knowle ased cou s / Self stu	dge to solve problems. Organization ar urse udy Details Coursework (assignme	Det	ails Weighting in fil	nal %)	Assess to	No. of Hours 36 12 100 ment Methods CLO Mapping
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Tutorials Reading Methods Assignme Examinat Dowd, K: Fiedler, R Franzetti, Basel Cor standards Basel Cor	knowle ased cousts / Self stu ments Measurii Li Opermittee and mommittee	dge to solve problems. Organization ar urse udy Details Coursework (assignme tutorials and class test(s))	Det	weighting in fit course grade (2005). (Chapters 1 nent. (Chapman & ternational Frame)	nal %) 60 40 4, 16) Hall/CRC I	Assess to CLO CLO Finance	No. of Hours 36 12 100 ment Methods CLO Mapping 1,2,3 1,2,3 Series, 2010) k measurement,

STAT4606 Risk management	ent and B	Basel Accords in banking and finance (6 credits)	Academic Year	2015			
Offering Department	Statistic	s & Actuarial Science	Quota				
Course Co-ordinator	Mr P K	Y Pang, Statistics & Actuarial Science (the_pang@yahoo.cor	n)				
Teachers Involved	Mr P K	Y Pang, Statistics & Actuarial Science					
Course Objectives	finance forming	ide comprehensive knowledge and in-depth understanding of industry to students. The focus is on management with be a part of the course. Accordingly, minimal background in quid. However, basic financial product (eg: bonds, swaps, option	asic measurement fu antitative methods wil	indamentals only I be required and			
Course Contents & Topics	- the im - risk na - design - the im - the col - measu - key col issues, - the im	urse introduces and explains: portance of risk management, iture and types, n and establishment of a risk management framework, portance of people and corporate culture, implete risk management cycle, irrement and management of credit, market and operational ri accords and the capital treatments for credit, market and ope developments (eg: Know-Your-Customers, Anti-Money laur portance of business continuity, n and implementation of a business continuity plan.	rational risks,	xley) and critica			
Course Learning Outcomes	On successful completion of this course, students should be able to:						
	CLO 1	understand the importance, nature and classification of va principle and cycle	rious risks, and the ri	sk management			
	CLO 2	design and establish a risk management framework					
	CLO 3						

		demonstr operation	rate knowledge and und nal risks	erstandir	ng of the measuren	nents of cre	dit, market and		
	CLO 4	explain a risks	nd describe Basel accords	and its	capital treatments for	credit, marke	t and operational		
	CLO 5	CLO 5 appreciate the importance of, design and implement a business continuity plan							
Pre-requisites (and Co-requisites and Impermissible combinations)		ass in STAT3910 Financial economics I or STAT3905 Introduction to fin erivatives and risk management or (FINA2322 Derivatives and any Univer							
Offer in 2015 - 2016	Y 21	nd sem			Exa	mination	May		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F	A+ to F							
Grade Descriptors	A	course though effectiv	strate thorough mastery at an ad learning outcomes. Show strong t, and ability to apply knowledge e organizational and presentation	analytical to a wide it al skills.	and critical abilities and log range of complex, familiar a	ical thinking, with and unfamiliar sit	h evidence of original tuations. Apply highly		
	В	course	nstrate substantial command of a base learning outcomes. Show eviden adge to familiar and some unfamiliar	ce of analy	tical and critical abilities ar	nd logical thinking	g, and ability to apply		
	С	learnin	nstrate general but incomplete co g outcomes. Show evidence of si dge to most familiar situations. Ap	ome analyt	tical and critical abilities an	d logical thinking	g, and ability to apply		
		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.							
	D	outcom limited	nes. Show evidence of some cohe ability to apply knowledge to	rent and lo	gical thinking, but with limite	ed analytical and	critical abilities. Show		
	D Fail	outcom limited presen Demon outcom	nes. Show evidence of some cohe ability to apply knowledge to	rent and log solve pro mmand of abilities, lo	gical thinking, but with limite oblems. Apply limited or knowledge and skills requestional and coherent thinking	ed analytical and barely effective lired for attaining Show very little	critical abilities. Show organizational and g the course learning or no ability to apply		
Course Type	Fail	outcom limited presen Demon outcom	nes. Show evidence of some cohe ability to apply knowledge to tational skills. strate little or no evidence of co nes. Lack of analytical and critical ddge to solve problems. Organizati	rent and log solve pro mmand of abilities, lo	gical thinking, but with limite oblems. Apply limited or knowledge and skills requestional and coherent thinking	ed analytical and barely effective lired for attaining Show very little	critical abilities. Show organizational and g the course learning or no ability to apply		
Course Teaching	Fail	outcom limited present Demon outcom knowle	nes. Show evidence of some cohe ability to apply knowledge to tational skills. strate little or no evidence of co nes. Lack of analytical and critical ddge to solve problems. Organizati	rent and log solve pro- mmand of abilities, lo on and pre-	gical thinking, but with limite oblems. Apply limited or knowledge and skills requestional and coherent thinking	ed analytical and barely effective lired for attaining Show very little	critical abilities. Show organizational and g the course learning or no ability to apply		
••	Fail Lecture-	outcom limited presen Demon outcom knowle	nes. Show evidence of some cohe ability to apply knowledge to tational skills. strate little or no evidence of co nes. Lack of analytical and critical ddge to solve problems. Organizati	rent and log solve pro- mmand of abilities, lo on and pre-	gical thinking, but with limite oblems. Apply limited or knowledge and skills required and coherent thinking sentational skills are minimals.	ed analytical and barely effective lired for attaining Show very little	critical abilities. Show e organizational and g the course learning or no ability to apply leffective.		
Course Teaching	Fail Lecture- Activiti	outcom limited presen Demon outcom knowle based cou	nes. Show evidence of some cohe ability to apply knowledge to tational skills. strate little or no evidence of co nes. Lack of analytical and critical ddge to solve problems. Organizati	rent and log solve pro- mmand of abilities, lo on and pre-	gical thinking, but with limite oblems. Apply limited or knowledge and skills required and coherent thinking sentational skills are minimals.	ed analytical and barely effective lired for attaining Show very little	critical abilities. Show a organizational and g the course learning or no ability to apply effective. No. of Hours		
Course Teaching	Fail Lecture- Activiti Lecture Tutorial	outcom limited presen Demon outcom knowle based cou	nes. Show evidence of some cohe ability to apply knowledge to tational skills. Instrate little or no evidence of cohes. Lack of analytical and critical dge to solve problems. Organizati	rent and log solve pro- mmand of abilities, lo on and pre-	gical thinking, but with limite oblems. Apply limited or knowledge and skills required and coherent thinking sentational skills are minimals.	ed analytical and barely effective lired for attaining Show very little	critical abilities. Show e organizational and g the course learning or no ability to apply leffective. No. of Hours 36		
Course Teaching	Fail Lecture- Activiti Lecture Tutorial	outcom limited present Demon outcom knowle based coulies lis g / Self stu	nes. Show evidence of some cohe ability to apply knowledge to tational skills. Instrate little or no evidence of cohes. Lack of analytical and critical dge to solve problems. Organizati	rent and log solve pro- mmand of abilities, lo on and pre-	gical thinking, but with limite oblems. Apply limited or knowledge and skills required and coherent thinking sentational skills are minimals.	ed analytical and barely effective directive directive or in all yellow and the second of the second	critical abilities. Show e organizational and g the course learning or no ability to apply leffective. No. of Hours 36		
Course Teaching & Learning Activities Assessment Methods	Fail Lecture- Activiti Lecture Tutorial Reading	outcom limited present	nes. Show evidence of some cohe ability to apply knowledge to tational skills. Instrate little or no evidence of cones. Lack of analytical and critical dige to solve problems. Organizationse	rent and log solve pro- mmand of abilities, lo on and pre-	gical thinking, but with limite oblems. Apply limited or knowledge and skills required and coherent thinking sentational skills are minimate tails Weighting in final	and analytical and barely effective directive directive or in a superior of the superior of th	critical abilities. Show a organizational and g the course learning or no ability to apply seffective. No. of Hours 36 12 100 ssment Methods		
Course Teaching & Learning Activities Assessment Methods	Fail Lecture- Activiti Lecture Tutorial Reading	outcom limited present outcom knowle obased coulies as g / Self studs ments	nes. Show evidence of some cohe ability to apply knowledge to tational skills. Instrate little or no evidence of cohes. Lack of analytical and critical dige to solve problems. Organizationse	rent and log solve pro- mmand of abilities, loon and pre-	gical thinking, but with limite oblems. Apply limited or knowledge and skills required and coherent thinking sentational skills are minimated tails Weighting in final course grade (%)	Asses	critical abilities. Show a organizational and g the course learning or no ability to apply seffective. No. of Hours 36 12 100 ssment Methods to CLO Mapping		
Course Teaching & Learning Activities Assessment Methods	Fail Lecture- Activiti Lecture Tutorial Reading Method Assignr Examin Crouhy, Jorion, F Hull, J. C	outcom limited present	nes. Show evidence of some cohe ability to apply knowledge to tational skills. Instrate little or no evidence of cones. Lack of analytical and critical idge to solve problems. Organizations: JISE Details Coursework (assign tutorials, and a class test)	rent and log solve pro-	gical thinking, but with limite oblems. Apply limited or knowledge and skills required and coherent thinking sentational skills are minimal sk	Asses CLO CGraw-Hill, 20 II (Wiley, 2010)	critical abilities. Show a organizational and a graph that the course learning or no ability to apply selfective. No. of Hours 36 12 100 ssment Methods to CLO Mapping D 1,2,3,4 1,2,3,4,5 006) D, 6th edition)		
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading	Fail Lecture- Activiti Lecture Tutorial Reading Method Assignr Examin Crouhy, Jorion, F Hull, J. C	outcom limited present	nes. Show evidence of some cohe ability to apply knowledge to tational skills. Instrate little or no evidence of cones. Lack of analytical and critical dige to solve problems. Organizations: Details Coursework (assign tutorials, and a class test) One 2-hour written examing. D. and Mark, R.: The Essel Risk Manager Handbook anagement and Financial Ir	rent and log solve pro-	gical thinking, but with limite oblems. Apply limited or knowledge and skills required and coherent thinking sentational skills are minimal sk	Asses CLO CGraw-Hill, 20 II (Wiley, 2010)	critical abilities. Show a organizational and a graph that the course learning or no ability to apply selfective. No. of Hours 36 12 100 ssment Methods to CLO Mapping D 1,2,3,4 1,2,3,4,5 006) D, 6th edition)		

STAT4607 Credit risk analy	sis (6 cr	edits)	Academic Year	2015		
Offering Department	Statistic	s & Actuarial Science	Quota			
Course Co-ordinator	Dr K P V	Vat, Statistics & Actuarial Science (watkp@hku.hk)				
Teachers Involved	Dr K P V	Vat, Statistics & Actuarial Science				
Course Objectives	swap, or resulting quantita understa	ommercial bank, credit risk has always been the most signific other counterparty instruments. Credit risk may also result from a change in the counterparty's creditworthiness. The tive models for measuring and managing credit risk. It also anding of the credit risk methodology used in the financial induce credit risk models operate.	om a change in the va is course will introdu o aims to provide sto	llue of an asset ce students to udents with an		
Course Contents & Topics	and inte	ities of default, recovery rates and loss given default; Defaul rnal rating models; Credit portfolio models such as CreditMo I approach; Credit derivatives.				
Course Learning Outcomes	On succ	essful completion of this course, students should be able to:				
	CLO 1	understand the Basel requirements for credit risk				
	CLO 2	estimate credit scores using the logit model				
	CLO 3	understand and estimate default probabilities using various KMV and the mortality method	approaches such as	Moody's, the		
	CLO 4	understand the concept of credit value-at-risk and the CreditM	letrics approach			
	CLO 5	estimate default correlations				

	CLO 6 as	sess ra	ating systems						
Pre-requisites (and Co-requisites and Impermissible combinations)		nt or	enrolled in STAT3910 Finar STAT3905 Introduction to fir course)						
Offer in 2015 - 2016	Y 2nd	sem			Exami	nation		Мау	
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	course	nstrate thorough mastery at an advance learning outcomes. Show strong analy t, and ability to apply knowledge to a re organizational and presentational skil	rtical and critical abilities wide range of complex,	s and logical	thinking,	with evid	ence of	original
	В	course	nstrate substantial command of a broad learning outcomes. Show evidence of edge to familiar and some unfamiliar situ	analytical and critical a	bilities and l	ogical thir	nking, and	ability t	
	С	learnin	nstrate general but incomplete comma g outcomes. Show evidence of some adge to most familiar situations. Apply m	analytical and critical ab	oilities and lo	gical thin	king, and	ability to	
	D	outcon limited	estrate partial but limited command of knes. Show evidence of some coherent ability to apply knowledge to solv tational skills.	nd logical thinking, but v	with limited a	nalytical a	and critica	l abilities	s. Show
	Fail	outcon	estrate little or no evidence of commandes. Lack of analytical and critical abiliting to solve problems. Organization and	es, logical and coheren	t thinking. Sl	how very	little or no	ability t	
Course Type	Lecture-bas	sed co	ırse						
Course Teaching	Activities			Details			N	lo. of l	Hours
& Learning Activities	Lectures								36
	Tutorials								12
	Reading /	Self stu	ıdy						100
Assessment Methods and Weighting	Methods	Methods Details		Weighting i		As	sessme to Cl	ent Met LO Ma	
	Assignmen	nts	Coursework (assignme tutorials, and class test(s))	nts,	40	CL	.O 1,2,3	,4,5,6	
	Examination	on	One 2-hour written examination	n	60	CL	.O 1,2,3	,4,5,6	
Required/recommended reading and online materials	Measureme Saunders, Approaches Loffler, G. a Jorion, P. (2	ent Mode A. and s to Val and Pode 2011).	roni, A. (2007). Risk Manage dels to Capital Allocation Policie d Allen, L. (2010). Credit Risk lue at Risk and Other Paradigm sch, P. N. (2010). Credit Risk M Financial Risk Manager Handbo	s. Wiley. Measurement In a s (3rd Edition). Wile odeling using Exce bok (6th Edition). W	and Out oney. I and VBA Iley.	of the F	inancia	Crisis	
	Hull, J. C. (Hull, J. C. (Gujarati, D. Bohn, J. R.	2012). 2012). N. and and S	D., and Mark, R. (2001). Risk Nanagement and Financia Options, Futures, and Other De d Porter, D. C. (2009). Basic Ectein, R. M. (2009). Active Credit 2003). Credit Portfolio Managen	al Institutions (3rd E rrivatives (8th Editio onometrics (5th Edi Portfolio Managem	dition). W n). Prentic tion). McG	ce Hall. Graw-Hil			
Course Website	Hull, J. C. (Hull, J. C. (Gujarati, D. Bohn, J. R.	2012). 2012). N. and and S C. W. (Risk Management and Financia Options, Futures, and Other De d Porter, D. C. (2009). Basic Ec- tein, R. M. (2009). Active Credit	al Institutions (3rd E rrivatives (8th Editio onometrics (5th Edi Portfolio Managem	dition). W n). Prentic tion). McG	ce Hall. Graw-Hil			

STAT4608 Market risk ana	lysis (6 cre	dits)	Academic Year	2015	
Offering Department	Statistics 8	Actuarial Science	Quota		
Course Co-ordinator	Dr Z Zhan	g, Statistics & Actuarial Science (zhangz08@hku.hk)			
Teachers Involved	Dr Z Zhan	g, Statistics & Actuarial Science			
Course Objectives	new meth	isk management has experienced a revolution in the ods for measuring risk, particularly Value-at-Risk (Vaent techniques covering the measurement of market riels, and stress testing.	R). This course introdu	ices modern risk	
Course Contents & Topics	Risk facto	ures; Value-at-Risk (VaR) models (parametric, Monte C r mapping; Advanced VaR models (GARCH-type mo principal Component Analysis and VaR; Backtesting and	dels, extreme-value the		
Course Learning Outcomes	On succes	sful completion of this course, students should be able	to:		
	CLO 1	understand VaR and expected shortfall as risk meas	sures		
	CLO 2	compute VaR and expected shortfall			
	CLO 3	model volatility using GARCH-type models			
	CLO 4	understand extreme-value theory			
	CLO 5	understand backtesting and stress testing			

Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in STAT4	(Pass in STAT3907 Linear models and forecasting and STAT3910 Financial economics I); or Pass in STAT4601 Time-series analysis and (FINA2320 Investments and portfolio analysis or STAT3609 The statistics of investment risk)]						
Offer in 2015 - 2016	Y 2nd sem		E	xamination	May			
Offer in 2016 - 2017	Υ		,					
Course Grade	A+ to F	to F						
Grade Descriptors	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.							
	cour	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.						
	lear	nonstrate general but incomplete comma ning outcomes. Show evidence of some wledge to most familiar situations. Apply m	analytical and critical abilities	and logical thinkin	g, and ability to apply			
	outc	nonstrate partial but limited command of loomes. Show evidence of some coherent and ability to apply knowledge to solventational skills.	and logical thinking, but with lir	nited analytical and	critical abilities. Show			
	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 of	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 fin		Assessment Methods to CLO Mapping			
	Assignments	Coursework (assignme tutorials, and a class test)	nts,	40 CLC	CLO 1,2,3,4,5			
	Examination	One 2-hour written examination	n 6	60 CLC	1,2,3,4,5			
Required/recommended reading and online materials	edition) Alexander, C.: N Alexander, C.: N Alexander, C.: N	ue-at-Risk: The New Benchmarl Market Models: A Guide to Financ Market Risk Analysis: Practical Fir Market Risk Analysis: Value-at-Ris Alysis of Financial Time Series (W	ial Data Analysis (Wiley, ancial Econometrics (W k Models (Wiley, 2009)	, 2001)	aw-Hill, 2007, 3rd			
Course Website	moodle.hku.hk							

STAT4609 Big data analytic	cs (6 cre	dits)	Academic Year	2015				
Offering Department	Statistic	s & Actuarial Science	Quota					
Course Co-ordinator	Dr G C	G C S Lui, Statistics & Actuarial Science (csglui@hku.hk)						
Teachers Involved	Dr G C	C S Lui, Statistics & Actuarial Science						
Course Objectives	such as extraction focuses	the past decade, huge volume of data with highly complicated structure has appeared in every as ch as social web logs, e-mails, video, speech recordings, photographs, tweets and others. The effit traction of valuable information from these data sources becomes a challenging task. This couses on the practical knowledge and skills of some advanced analytics and statistical modelinglying big data problems.						
Course Contents & Topics		alytics, text analytics, sentiment analytics, link analysis (collaborative filtering), and parallel computing for big of		is, recommend				
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1	understand and apply a wide range of data a characteristics, strengths and weaknesses	nalytic techniques, and	recognize the				
	CLO 2 obtain hands-on experience of computer software for data analytics							
	CLO 3 identify and use appropriate data analytic techniques for data extraction, taking into account both the structure of the data and the goals of the user of the discovered knowledge							
	CLO 4	evaluate the quality of discovered knowledge, taking analytic task being performed and the goals of the use		ents of the data				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	STAT3612 Data mining						
Offer in 2015 - 2016	Y 2	nd sem	Examination	May				
Offer in 2016 - 2017	Υ							

Course Grade	A+ to F							
Grade Descriptors	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	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	outco	onstrate partial but limited command of k omes. Show evidence of some coherent a d ability to apply knowledge to solventational skills.	and log	ical thinking, but with limited a	nalytical and critical abilities. Show		
	Fail	outco	onstrate little or no evidence of comma omes. Lack of analytical and critical ability eledge to solve problems. Organization ar	ies, lo	gical and coherent thinking. SI	now very little or no ability to apply		
Course Type	Lecture-ba	ased co	ourse					
Course Teaching & Learning Activities	Activities	Activities			Details No. of Hours			
& Learning Activities	Lectures					36		
	Tutorials					12		
	Reading /	/ Self s	study			100		
Assessment Methods and Weighting	Methods	i	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Assignme	ents	Coursework (assignme tutorials, and class test(s))	nts,	50	CLO 1,2,3,4		
	Examinat	tion	One 2-hour written examination	n	50	CLO 1,3,4		
Required/recommended reading and online materials	Hastie, T. and Predic Liu, B.: We	, Tibsh ction (S eb Data	oack, M. and Kumar, V.: Introduct iirani R. and Friedeman, J.: The Springer, New York, 2009, 2nd ec a Mining: Exploring Hyperlinks, C tical Pattern Recognition (Wiley, 2	Elendition	nents of Statistical Learr) nts and Usage Data (Sp	ning: Data Mining, Inference,		
Course Website	moodle.hk	ku.hk						

STAT4710 Capstone exper	ience fo	r statistics undergraduates (6 credits)	Academic Year	2015				
Offering Department	Statistic	s & Actuarial Science	Quota	50				
Course Co-ordinator	Prof W	K Li, Statistics & Actuarial Science (saas@hku.hk)						
Teachers Involved	Prof W	K Li, Statistics & Actuarial Science						
Course Objectives	This project-based course aims to provide students with capstone experience to formulate and invest real life problems in the area of statistics, risk management, finance, climate, social science, medicine scientific research by integrating and applying the statistical theories and quantitative techniques lead their junior university years.							
Course Contents & Topics	work in	hal teaching. Students are expected to devote 120-140 horeogroups of four or five under the supervision of a teation on their work two to three weeks before the end of and of the semester.	acher. Students are re	equired to give a				
	It aims to help the students to establish a good and solid foundation of life-long learning skills, and to enable students to equip with hands-on experience in solving real life problems starting from identification of the key variable(s) of interest, literature search, model formulation, data analysis or simulation, technical report writing and presentation of the results. Students will need to find an interesting topic of their own, conduct literature search regarding the most recent research related to the problem, make suggestions to improve the current situations or even solve the problem identified in their project.							
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 formulate a problem using statistical or risk management ideas for a particular issue we are facing with and determine ways in which statistics/risk management can be used to solve the problems or to make predictions							
	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 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 (and Co-requisites and Impermissible combinations)	STAT4	s are expected to have satisfactorily completed at least 2 (XX or STAT6XXX) disciplinary core/elective courses in E s Majors. Students who are interested in taking the cour	Decision Analytics, Risk	Management, an				

	Department. This capstone course is for Decision Analytics, Risk Management, and Statistics Majors studis mutually exclusive with STAT3799, STAT4799 and STAT4766. The earliest that a student is allowed to take this capstone course is their year 3 study. Y 1st sem 2nd sem Examination						tudents only, and	
Offer in 2015 - 2016	Y 1s	Y 1st sem 2nd sem Examination						
Offer in 2016 - 2017	Υ							
Course Grade	A+ to F	A+ to F						
Grade Descriptors	A	course lea thought, a	te thorough mastery at an advance rning outcomes. Show strong analy nd ability to apply knowledge to a w ganizational and presentational skill	tical and vide rang	critical abilities and logical thi	nking, with	evidence of original	
	В	course lea	tte substantial command of a broad rring outcomes. Show evidence of to familiar and some unfamiliar situa	analytica	I and critical abilities and logic	al thinking	, and ability to apply	
	С	learning or	te general but incomplete commar utcomes. Show evidence of some a to most familiar situations. Apply mo	analytical	and critical abilities and logic	al thinking	, and ability to apply	
	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	outcomes.	tte little or no evidence of commar Lack of analytical and critical abilition to solve problems. Organization and	es, logica	al and coherent thinking. Show	very little	or no ability to apply	
Course Type	Project-b	ased course						
Course Teaching	Activitie	vities De		Detail	s		No. of Hours	
& Learning Activities	Reading	/ Self study		Tutoria readin	als, group work/projo g/self-study	work/project, 12		
Assessment Methods and Weighting	Method	s	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping		
	Oral pre	sentation	oral presentation and attend	dance	45	CLO	1,2,3,4,5,6	
	Researc	ch report	written report		55	CLO	1,2,3,4,5,6	
Required/recommended reading and online materials			xtbooks and references. Stu y, e-journals, internet, and dis					
Course Website	moodle.h	ku hk						

STAT4711 Capstone expe	erience	for actuarial science undergraduates (6 credits)	Academic Year	2015					
Offering Department	Statistic	s & Actuarial Science	Quota	50					
Course Co-ordinator	Prof W I	K Li, Statistics & Actuarial Science (saas@hku.hk)							
Teachers Involved	Prof W I	K Li, Statistics & Actuarial Science							
Course Objectives	practica their un skills, a	ect-based course aims to provide students with capstone experience to formulate and investigate problems in actuarial science by integrating and applying actuarial theories and techniques learnt inversity years. It aims to help the students to establish a good and solid foundation of self-learning doto enable students to equip with hands-on experience in solving practical problems including of the problem, designing the solution, and presentation of the results.							
Course Contents & Topics	this proj supervis the sem Topics a such as Student suitable Departn Student	all teaching will be given for this course. Students are expeted. Students will work in groups of four or five under the stor. Students are required to give a presentation on their waster, and submit their final report at the end of the semester acceptable for projects in this course can be related to any of a life insurance, pension, finance, investment, enterprise is a realso encouraged to suggest topics in non-traditional teacher and/or industry supervisor. All topics for this courment to ensure relevance to actuarial science.	upervision of a teacher york two to three weeks or. of the traditional actuaria risk management and y actuarial areas provide se will be subject to fin	and/or an industry before the end of all areas of practice general insurance ed they can find a all approval by the regarding industry					
Course Learning Outcomes									
	CLO 1	CLO 1 define a practical problem, discuss the issues faced by different stakeholders, and design workabl solutions for the problems							
	CLO 2	integrate theoretical results and practical approaches, developments	integrate theoretical results and practical approaches, and to specify limitations of current developments						
	CLO 3	work in a team and to collaborate with members with different	ent background						
	CLO 4	deliver actuarial results effectively in a written report and in	oral presentations						
	CLO 5	develop further logical, critical thinking, creativity, technical report writing, communication and consultation skills							

		explain to a r inancial secu	non-actuarial audience the app rity system	roach	es of actuarial science a	s applie	d to problems in a		
Pre-requisites (and Co-requisites and Impermissible combinations)	STAT6XX enrolled ir Pass in S This caps and STAT	(X) in BSc(An this course TAT3909 Ad tone course T4767.	redits of advanced level discip Actuarial Science) programm; or vanced life contingencies, or a is for BSc(Actuarial Science) dent is allowed to take this cap	e incl Iready stude	luding (STAT3901 Life) renrolled in this course); ents only, and is mutually	conting and exclusi	encies, or already		
Offer in 2015 - 2016	Y 1st	sem 2nd s	sem		Examina	tion	No Exam		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	A	course learn	e thorough mastery at an advanced ning outcomes. Show strong analytic d ability to apply knowledge to a wic anizational and presentational skills.	al and	critical abilities and logical thi	nking, wit	h evidence of original		
	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.							
	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 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	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	Project-ba	ased course							
Course Teaching	Activitie	s		Details			No. of Hours		
& Learning Activities	Reading	Reading / Self study			Tutorials, group work/project, reading/self-study				
Assessment Methods and Weighting	Methods	3	Details		Weighting in final course grade (%)	Asse	essment Methods to CLO Mapping		
	Oral pres	sentation	oral presentation and attenda	nce	45	CLC	1,2,3,4,5,6		
	Research	n report	written report		55	CL	O 1,2,3,4,5		
Course Website	moodle.hl	ku.hk							

STAT4766 Statistics intern	ship (6 d	credits)		Academic Year	2015				
Offering Department	Statistic	cs & Actuarial Science		Quota					
Course Co-ordinator	Dr K P	Or K P Wat, Statistics & Actuarial Science (watkp@hku.hk)							
Teachers Involved	Various	teachers as the asses	sors of oral presentations and	d written reports, Statistics & A	Actuarial Science				
Course Objectives	take on	his course is offered to students majoring in Statistics or Risk Management who ake on a minimum of 160 hours of internship work related to his major disciplines. It provides students with rst-hand experience in the applications of academic knowledge in a real-life work environment.							
Course Contents & Topics	present experie	Upon completion of the internship, each student is required to submit a written report and to give presentation on his/her internship experience. The report should emphasize important working/educations experiences encountered by the student during his/her internship. In many situations, this would mean eport of the project(s) that the student has been involved in during his/her internship.							
Course Learning Outcomes	On successful completion of this course, students should be able to:								
	CLO 1 gain first-hand work experience in an industry related to statistics and risk management								
	CLO 2 apply knowledge in statistics and risk management to solve practical problems in the work place								
	CLO 3 understand contexts for specific quantitative skills developed in basic statistics and risk management courses								
	CLO 4 communicate specialist knowledge in statistics and risk management to non-experts in a work environment								
Pre-requisites (and Co-requisites and Impermissible combinations)	STAT6 This ca is mutu	XXX) in the Decision A pstone course is for Deally exclusive with STA	nalytics, Risk Management, a ecision Analytics, Risk Manag	gement, and Statistics Majors	•				
Offer in 2015 - 2016	Y 1	st sem 2nd sem S	ummer	Examination	No Exam				
Offer in 2016 - 2017	Υ			,					
Course Grade	Pass/F	ail							
Grade Descriptors									

	Pass Able to apply knowledge to solve problems in the workplace. Successfully handles and carries out the win the job or assigned by supervisor(s). Establishes effective collaboration and communication with st colleagues, and clients in the job. Successfully fulfills the requirements set out in the Course Description working hours, written and oral report, and evaluation by supervisor(s), etc. Students demonstrating 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 requires.							
	colleague	or assigned by supervisor(s). Fails to establish effective collaboration or communication with supervisor(s), oth colleagues, or clients in the job. Fails to satisfy the requirements set out in the Course Description regarding work hours, written and oral report, or evaluation by supervisor(s), etc.						
Course Type	Internship							
Course Teaching & Learning Activities	Activities		Details	S	No. of Hours			
a Learning Activities	Internship work		work a	pected that students and least 160 hours (or lent of 4 weeks full-time	the 160			
Assessment Methods and Weighting	Methods	Details		Weighting in final course grade (%)	Assessment Methods to CLO Mapping			
	Oral presentation	oral presentation and in-class discussion		40	CLO 1,2,3,4			
	Written report	written report		60 CLO 1,2,3,4				
Required/recommended reading and online materials	presentation on the performance during	the internship, each student eir internship experience. S the internship period (in the ss the student based on the fe	Supervis e case	sors will assess the sof internships outside t	students based on their he university, the internal			
Course Website	moodle.hku.hk							
Additional Course Information	internship will be re Students who are in Enrolment of this co	tion of this course can be corded on the student's trans terested to enrol in this course ourse is not conducted via t nt Department/School office	script. T e should he onlir	his course will be assed I contact the Departmen ne course selection sys	ssed on "Pass/Fail" basis. It to obtain the approval. Item and should be made			

STAT4767 Actuarial scien	ce interns	ship (6 credits)	A	cademic Year	2015				
Offering Department	Statistics	& Actuarial Science	Q	uota					
Course Co-ordinator	Dr L F K N	Ng, Statistics & Actuarial Science (flouisng	g@hku.hk)						
Teachers Involved	Various te	achers as the assessors of oral presenta	tions and written reports	s, Statistics & Act	uarial Science				
Course Objectives		is course is offered to actuarial science students who take on an 6-month full time or sin ernships. The objective is for a student to complete this course as a project based on his/her internshi							
Course Contents & Topics	encounter	his course will include a written report which should emphasize important working/ educational experient accountered by the student during his/her internship. In many situations, this would mean a report of oject(s) that the student has been involved in during his/her internship.							
Course Learning Outcomes	On succes	ssful completion of this course, students s	should be able to:						
	CLO 1	CLO 1 gain practical experiences during internship							
	CLO 2	describe basic actuarial practices learner	d during the internship						
	CLO 3	explain how actuarial theories learned in	University can be appli	ed in practice	e				
	CLO 4	provide context for specific technical skill	ls developed in basic ac	ctuarial courses					
Pre-requisites (and Co-requisites and Impermissible combinations) Offer in 2015 - 2016	STAT6XX This caps The earlie	Pass in at least 24 credits of advanced level disciplinary core/elective courses (STAT3XXX, STAT4XXX or STAT6XXX) in BSc(Actuarial Science) programme including STAT3901 Life contingencies; and This capstone course is for BSc(Actuarial Science) students only; and is mutually exclusive with STAT4711. The earliest that a student is allowed to take this capstone course is their year 3 study. Y 1st sem 2nd sem No Exam							
Offer in 2016 - 2017	Υ 130	sem 2nd sem		Kammation	No Exam				
Course Grade	Pass/Fail								
	Pass/Fall								
Grade Descriptors	Pass	Able to apply knowledge to solve problems in the job or assigned by supervisor(s). Establi colleagues, and clients in the job. Successfully working hours, written and oral report, and performance in the above would be awarded a g	ishes effective collaboration fulfills the requirements set evaluation by supervisor(s)	and communication out in the Course D	with supervisor(s), escription regarding				
	Fail	Very limited or no ability to solve problems in the	e workplace. Fails to handle	or carry out the work	equired in the ich or				
	raii	assigned by supervisor(s). Fails to establish colleagues, or clients in the job. Fails to satisfy hours, written and oral report, or evaluation by su	effective collaboration or the requirements set out in	communication with	supervisor(s), other				
Course Type	Internship	assigned by supervisor(s). Fails to establish colleagues, or clients in the job. Fails to satisfy hours, written and oral report, or evaluation by su	effective collaboration or the requirements set out in	communication with	supervisor(s), other				
Course Type Course Teaching & Learning Activities		assigned by supervisor(s). Fails to establish colleagues, or clients in the job. Fails to satisfy hours, written and oral report, or evaluation by st	effective collaboration or the requirements set out in	communication with	supervisor(s), other				

Assessment Methods and Weighting	Methods	Details	Weighting in final course grade (%)	Assessment Methods to CLO Mapping
	Oral presentation	oral presentation and in-class discussion	40	CLO 2,3,4
	Written report	written report	60	CLO 2,3,4
Course Website	moodle.hku.hk			
Additional Course Information	the employer/direct s Satisfactory comple internship will be re Students who are int Enrolment of this co	g for this assessment component, the supervisor is required for passing the tion of this course can be counted corded on the student's transcript. The terested to enrol in this course should ourse is not conducted via the onling Department/School office after appropriate the statement of the st	course. d towards the Capstor his course will be asse contact the Department ne course selection sys	ne requirement. Details of essed on "Pass/Fail" basis. to obtain the approval.

STAT4798 Statistics and a	ctuarial s	cience p	roject (6 credits)		Academi	ic Year	2015			
Offering Department	Statistics 8	& Actuarial	Science		Quota		50			
Course Co-ordinator	Prof S M S	Lee, Stati	stics & Actuarial Science (sm	slee @h	ku.hk)					
Teachers Involved	Various te	rious teachers as the assessors of oral presentations and written reports, Statistics & Actuarial Science								
Course Objectives	,		ojects suitable for Actuarial S in approaching a real problem							
Course Contents & Topics		ese projects, under the supervision of individual staff members, involve the applications of statistics and/or bability in a wide range of problems of practical and/or academic interests.								
Course Learning Outcomes	On succes	sful compl	etion of this course, students	should b	e able to:					
	CLO 1 fe	CLO 1 formulate meaningful research problems								
	CLO 2	earn and a	pply advanced techniques in p	orobabili	ty and/or statistics to so	lve real li	fe problems			
	CLO 3 s	ummarize	and present research findings	s in a pro	ofessional manner					
Pre-requisites (and Co-requisites and Impermissible combinations)	STAT6XX Linear mod Pass or al STAT3911 and This caps coordinate	X) in BSc(dels and for ready enro Financial tone cours r. This cour	credits of advanced level disc Actuarial Science) programm recasting; and billed in at least one of the foll economics II, STAT4601 Till the is for BSc(Actuarial Scien rese is mutually exclusive with adent is allowed to take this ca	ne including of the inc	ding STAT3902 Statisticourses: STAT3616 Addes analysis, STAT4602 dents only; and subjectation.	cal mode vanced S Multivari t to the c	AS programming the data analysis			
Offer in 2015 - 2016	Y 1st	sem 2nd	sem		Examina	tion	No Exam			
Offer in 2016 - 2017	Υ				<u>'</u>					
Course Grade	A+ to F	A+ to F								
Grade Descriptors	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 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.]								
	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. Apply effective organizational and presentational skills.									
	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									
	Fail									
Course Type	Project-ba	sed course)							
Course Teaching	Activities			Detail	s		No. of Hours			
& Learning Activities		Self study		Dotail			120			
Assessment Methods and Weighting	Methods		Details		Weighting in final course grade (%)		ssment Methods to CLO Mapping			
			oral presentation & in							
	Oral pres	entation	oral presentation & in discussion	n-class	40	С	LO 1,2,3			

Additional Course Approval is subject to past academic performance.	
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STAT4799 Statistics project	ct (12 cre	edits)			Aca	demic Yea	r 2015		
Offering Department	Statistics	Statistics & Actuarial Science				ota	30		
Course Co-ordinator	Prof S M	of S M S Lee, Statistics & Actuarial Science (smslee@hku.hk)							
Teachers Involved	Various t	rious teachers as the assessors of oral presentations and written reports, Statistics & Actuarial Science							
Course Objectives		ch year a few projects suitable for Statistics or Risk Management major students will be offered to provide dents with practical experience in approaching a real problem, in report writing and in oral presentation.							
Course Contents & Topics			the supervision of individual ange of problems of practical a				ns of statistics and/or		
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 statistics or related areas								
			s in important technical tools, ical research and data analys		ng the use of com	puter softw	are or programs, for		
	CLO 3	write succinc	t reports on the findings of a r	esearcl	h study				
	CLO 4	make concis	e oral presentation of the findi	ngs of a	a research study				
Pre-requisites (and Co-requisites and Impermissible combinations)	STAT6XX statistical Pass or a STAT391 and Not for st This caps subject to	as in at least 24 credits of advanced level disciplinary core/elective courses (STAT3XXX, STAT4XXX of AT6XXX) in the Major in Risk Management / Statistics / Decision Analytics including STAT3600 Lineatistical analysis; and as or already enrolled in at least one of the following courses: STAT3616 Advanced SAS programming AT3911 Financial economics II, STAT4601 Time-series analysis, STAT4602 Multivariate data analysis, for students who have already enrolled in STAT3799 Directed studies in statistics in this academic year. It is capstone course is for Decision Analytics, Risk Management, and Statistics Majors students only; an opject to the consent of course coordinator. This course is mutually exclusive with STAT4710.							
Offer in 2015 - 2016	Y Ye	ear long			Exa	mination	No Exam		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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 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.]								
	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. 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. Apply moderately effective organizational and presentational skills.								
	D	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-b	ased course							
Course Teaching	Activitie	es		Detail	ls		No. of Hours		
& Learning Activities	Reading	ı / Self study		discus	arly in the cours	supervisor	240		
Assessment Methods and Weighting	Method	s	Details		Weighting in fir course grade (sessment Methods to CLO Mapping		
	Disserta	tion	written report			60	CLO 1,2,3		
	Oral pre	sentation	oral presentation & indiscussion	-class		40	CLO 1,2,4		
O	maadla b	ku bk							
Course Website	moodle.h	IKU.IIK							

STAT4901 Risk theory II (6 c	redits)	Academic Year	2015	

Offering Department	Statistic	s & Actuar	rial Science		Quota	l				
Course Co-ordinator	Dr J K V	Voo, Statis	stics & Actuarial Science (jkwoo	u.hk)						
Teachers Involved	Dr J K V	Voo, Statis	stics & Actuarial Science							
Course Objectives			advanced course in risk theory eory, ruin theory, aggregate cla				ed in STAT3906. I			
Course Contents & Topics	coefficie mixed	Utility theory; discrete ruin model; compound Poisson risk model; ruin probability; reinsurance; adjustmet coefficient; Lundbergs inequality; Tijms approximation; non-homogeneous birth process; contagion mode mixed Poisson process; inflation model; IBNR (Incurred But Not Reported) claims; mixed Erland distributions; stop-loss moments; equilibrium distributions.								
Course Learning Outcomes	On succ	essful con	npletion of this course, students	shou	uld be able to:					
	CLO 1		nd utility theory including some and utility maximization	comi	monly used utility functi	ions, Jense	ns inequality, risk			
	CLO 2	define dis	screte and continuous ruin mode	els						
	CLO 3	calculate	the adjustment coefficient, Lune	dberg	s inequality and Tijms	approximati	ion in ruin theory			
	CLO 4	understa	nd the effect of reinsurance and	char	nge of parameters on ru	ıin probabili	ity			
	CLO 5	understai frequenci	nd non-homogeneous birth pro es	cess	and its applications as	contagion	models for claim			
	CLO 6	understai IBNR mo	nd mixed Poisson process and del	d its	applications including	the inflatio	n model and the			
	CLO 7	derive the	e relationship between stop-loss	mor	nents and equilibrium d	istributions				
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	STAT3906	6 Risk theory I							
Offer in 2015 - 2016	Y 2	nd sem			Exam	ination	May			
Offer in 2016 - 2017	Υ									
Course Grade	A+ to F									
Grade Descriptors	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 outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilitie limited ability to apply knowledge to solve problems. Apply limited or barely effective organizatio presentational skills.					critical abilities. Show				
	Fail Demonstrate little or no evidence of command of knowledge and skills required for attaining the course lear outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no ability to a knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					or no ability to apply				
Course Type	Lecture-	based cou	ırse							
Course Teaching	Activit	ies		Det	ails		No. of Hours			
& Learning Activities	Lecture	es					36			
	Tutoria	ls					12			
	Readin	g / Self stu	ıdy				100			
Assessment Methods and Weighting	Method	ds	Details		Weighting in final course grade (%)		ssment Methods to CLO Mapping			
	Assign	ments	Coursework (assignme tutorials, and a class test)	nts,	25		1,2,3,4,5,6			
	Examir	nation	One 3-hour written examinatio	n	75	CLO	1,2,3,4,5,6			
Required/recommended reading and online materials	2007, 31 Kaas R edition). Bowers 2nd edit Willmot	rd edition). ., Goovae N.L., Gerb ion). G.E. & Lir	erts M., Dhaene J., & Denuit per H.U., Hickman J.C. & Jones on X.S.: Lundberg Approximation	M.: N	Modern Actuarial Risk	Theory (S	pringer, 2004, 1s			
Course Website	, , ,		st edition).							
Course Website	moodle.	riku.hk								

STAT4902 Selected topics i	n actuarial science (6 credits)	Academic Year	2015
Offering Department	Statistics & Actuarial Science	Quota	

Course Co-ordinator	TBC, Statis	stics &	Actuarial Science ()							
Teachers Involved	TBC, Statis	TBC, Statistics & Actuarial Science								
Course Objectives	graduate s	This course is an advanced course in actuarial science which discusses selected topics which potential graduate students will find useful. It focuses on tools that are in the frontier of actuarial science with examples on applications.								
Course Contents & Topics	Coherent dominance Generalize	The contents will be chosen from the following topics: Coherent risk measures; Premium calculation principles; Copulas; Extreme value theory; Stochas dominance; Ordering of risks; Renewal equations with insurance applications; Reliability propertie Generalized linear models; Comonotonicity; Measures of dependency; Phase-type distribution Applications to enterprise risk analysis; Other topics as determined by the instructor.								
Course Learning Outcomes	On success	sful co	mpletion of this course, students sh	ould be able to:						
	CLO 1	CLO 1 understand the mathematical tools useful for further research and applications								
	CLO 2	apply t	he tools to solve potentially unseen	problems						
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in ST	Pass in STAT3906 Risk theory I								
Offer in 2015 - 2016	N			Exami	nation					
Offer in 2016 - 2017	N									
Course Grade	A+ to F									
Grade Descriptors	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.								
	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	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 co	urse							
Course Teaching	Activities		D	etails		No. of Hours				
& Learning Activities	Lectures					36				
	Tutorials					12				
	Reading /	Self st	udy			100				
Assessment Methods and Weighting	Methods		Details	Weighting in final course grade (%)		sment Methods o CLO Mapping				
	Assignme	nts	Coursework (assignments tutorials and class test(s))	, 40	CL	O 1,2				
	Examination	on		60	CL	O 1,2				
Required/recommended reading and online materials	edition). - Denuit M.	Kaas R., Goovaerts M., Dhaene J., & Denuit M.: Modern Actuarial Risk Theory (Springer, 2004, 1s								
and online materials	 Willmot Application McNeil A. 	ıs (Spri .J., Fre	nger, 2000, 1st edition).	·						

STAT4903 Actuarial technic	ques for general insurance (6 credits)	Academic Year	2015			
Offering Department	Statistics & Actuarial Science Quota					
Course Co-ordinator	Dr L F K Ng, Statistics & Actuarial Science (flouisng@hku.hk)					
Teachers Involved	Dr L F K Ng, Statistics and Actuarial Science					
Course Objectives	The purpose of this course is to develop knowledge of the basic technical claim liabilities for general insurance. Application of the actuarial technical problems will be emphasized. The course also provides general knowledge in Hong Kong and China. Students will acquire the fundam actuarial science together with the supporting calculations.	nniques to resolve gen nowledge on the ger	neral insurance neral insurance			
Course Contents & Topics	General Insurance Markets in Hong Kong, Taiwan and PRC Introduction of general insurance markets					

	- Regulat	ions on	general insurance				
Course Learning Outcomes	2. Basic t - How to - Ratema - Ratema - Ratema - Calculat - Pure pre - Loss Ra - Rating c - Conside 3. Estima - Data rec - Build ar - Reservi - Conside - Estimat - Apprais 4. Concu	echnique read and king relaking relaking relaking relaking relaking relaking retail reations ting claiquirement analyzing techrerations reations reations are recovered and varrent top dictive n	es for ratemaking d use manual rate pages ated to exposures ated to premiums ated to loss and loss adjustment inderwriting expense provisions methods and relativities when selecting the final rates int it is a selected to the selection of the s	ties nt ex	penses deling in General Insu	rance	
	CLO 1	unders	stand the feature and underlying	risk	of general insurance	products	
	CLO 2	calcula	ate the premium rate for basic go	enera	al insurance products		
	CLO 3	estima	te the claims liabilities for gener	al ins	surance products		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	TAT390	6 Risk theory I				
Offer in 2015 - 2016	Y 2nd	l sem			Exa	mination	May
Offer in 2016 - 2017	Υ						
Course Grade	A+ to F						
Grade Descriptors	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						
	D Demonstrate partial but limited command of knowledge and skills required for attaining some of the course outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abiliti						me of the course learning and critical abilities. Show
	Fail	Pail Demonstrate little or no evidence of command of knowledge and skills required for attaining the cours outcomes. Lack of analytical and critical abilities, logical and coherent thinking. Show very little or no abil knowledge to solve problems. Organization and presentational skills are minimally effective or ineffective.					little or no ability to apply
Course Type	Lecture-ba	ased co	urse				
Course Teaching & Learning Activities	Activitie	s		Det	ails		No. of Hours
<u>G</u>	Lectures						36
	Tutorials						12
	Reading	/ Self st	udy				100
Assessment Methods and Weighting	Methods	•	Details		Weighting in final course grade (%)	As	sessment Methods to CLO Mapping
	Assignme	ents	Coursework (assignme tutorials, and a class test)	nts,	25		CLO 1,2,3
	Examina	tion	One 3-hour written examinatio	n	75		CLO 2,3
Required/recommended reading and online materials	Version, J	uly 2010	Estimating Unpaid Claims Usir) lodlin, C., Basic Ratemaking, Ca	Ū	•	•	•
Course Website	moodle.hl	ku.hk					
Additional Course Information	Trending American Principles Casualty Property a	Standar Procedu Acadei , June 1 Actuaria and Cas	d Board of the American Acade res in Property/Casualty Insurar my of Actuaries Committee o 980 al Society Committee on Rate ualty Insurance Ratemaking, Ca rsonal Automobile Premiums:	nce F n Ri emak asual	Ratemaking sk Classification, Ri king Principles, State ty Actuarial Society, N	sk Classifi ment of I lay 1988	cation Statement of

Insurance, PCAS LXXXIII, 1996, pp. 190-256 (excluding Secions 7-9)
Insurance Services Office, Inc., Personal Automobile Manual (Effective 6-98), General Rules 1-6 only.

Offering Department	04. 11. 11		d-1 O-1			0		2015
		Citationic C / initiatinal colorine						
Course Co-ordinator		Dr J F Xu, Statistics & Actuarial Science (saas @hku.hk)						
Teachers Involved	Dr J F Xu, Statistics & Actuarial Science							
Course Objectives	useful in p	This course introduces some statistical concepts and methods which potential graduate students will fin useful in preparing for work on a research degree in statistics. Focus is on applications of state-of-the-a statistical techniques and their underlying theory.						
Course Contents & Topics	1. Basic a limit theore 2. Parame variants; s 3. Nonparegression 4. Comput 5. Robust 6. Sequen 7. Model s	asympto ems; de etric and igned lik rametrica; densit rationally method tial anal election	selected from: tic methods: modes of convergita method; Edgeworth expansion I nonparametric likelihood method in the selihood ratio statistics; empiricate statistical inference: sign and yestimation; kernel methods. y-intensive methods: cross-valics: measures of robustness; Meeysis: sequential probability ration using information criteria. determined by the instructor.	ons; sons; s	saddlepoint appro high-order appro- lihood. nk tests; Kolmo r; bootstrap; permator; L-estimator;	oximations. poximations; p gorov-Smirn nutation meth R-estimator;	orofile ov tes nods.	likelihood and it
Course Learning Outcomes	On succes	sful cor	npletion of this course, students	shou	uld be able to:			
	CLO 1 comprehend the language and technicalities found in statistical research literature							
	CLO 2	understa	and the use of standard mathen	natica	al tools for conduc	cting statistic	al rese	arch
	CLO 3	apply a	variety of research tools to solve	e star	ndard statistical p	roblems		
	CLO 4	acquire	exposure to some development	s in c	contemporary sta	tistical resea	ırch	
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	TAT3600	Clinear statistical analysis or S	ТАТЗ	907 Linear mode	els and forec	asting	
Offer in 2015 - 2016	Y 1st	sem				Examinatio	n	Dec
Offer in 2016 - 2017	Υ				·			
Course Grade	A+ to F							
Grade Descriptors	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 become							
	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 learnin outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. Shor limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational an presentational skills.							
	Fail		nstrate little or no evidence of comma nes. Lack of analytical and critical abilit	ies, log	gical and coherent th	inking. Show ve	ery little o	or no ability to apply
			dge to solve problems. Organization ar	d pres	entational skills are r	ninimally effecti		
Course Type	Lecture-ba	knowle	dge to solve problems. Organization ar	nd pres	entational skills are r	ninimally effecti		
Course Teaching	Lecture-ba	knowle	dge to solve problems. Organization ar	Deta		ninimally effectr		No. of Hours
Course Teaching		knowle	dge to solve problems. Organization ar			ninimally effecti		No. of Hours
Course Teaching	Activities	knowle	dge to solve problems. Organization ar			ninimally effecti		
Course Teaching	Activities Lectures	knowled course	dge to solve problems. Organization ar			ninimally effecti		36
Course Teaching & Learning Activities	Activities Lectures Tutorials Reading	knowled	dge to solve problems. Organization arurse		ails		A 2000	36 12 100
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Tutorials	knowled	dge to solve problems. Organization ar			inal		36 12
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Tutorials Reading	knowled sased cou	dge to solve problems. Organization arurse	Deta	ails Weighting in f	inal	to	36 12 100 sment Methods
Course Teaching & Learning Activities Assessment Methods	Activities Lectures Tutorials Reading	knowled	urse Details Coursework (assignme	Deta	ails Weighting in f	inal (%)	CLO	36 12 100 sment Methods o CLO Mapping
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Activities Lectures Tutorials Reading // Methods Assignme Examinat DasGupta Efron, B. a Owen, A.E Shao, J. (**)	knowled ased could be ased cou	udy Details Coursework (assignme tutorials, and a class test)	Det:	weighting in f course grade and Probability. So the Bootstrap. (Hall: Boca Raton. of York.	inal (%) 25 75 pringer:.	CLO CLO	36 12 100 sment Methods o CLO Mapping 1,2,3,4 1,2,3,4

STAT7610 Advanced proba	ability (6 c	redits)			Academic Year	2015			
Offering Department	Statistics	Statistics & Actuarial Science Quota							
Course Co-ordinator	Prof J J F	Prof J J F Yao, Statistics & Actuarial Science (jeffyao@hku.hk)							
Teachers Involved	Prof J J F	Prof J J F Yao, Statistics & Actuarial Science							
Course Objectives	basic cor	This course provides an introduction to measure theory and probability. The course will focus on son basic concepts in theoretical probability which are important for students to do research in actuar science, probability and statistics.							
Course Contents & Topics	measurab	sigma-algebra, measurable space, measure and probability, measure space and probability spac measurable functions, random variables, integration theory, characteristic functions, convergence random variables, Hilbert spaces, conditional expectation, martingales.							
Course Learning Outcomes	On succe	ssful con	npletion of this course, students	should be able to:					
	CLO 1 understand the fundamental measure theory and probability theory								
		CLO 2 learn the general concept of integration, understand the monotone convergence theorem, Fatou's lemma and dominated convergence theorem							
	CLO 3 ι	understar	nd the concept of conditional ex	pectation					
	CLO 4	nave som	ne elementary knowledge of ma	rtingale					
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in S	TAT3603	3 Probability modelling or STAT	3903 Stochastic mod	lels				
Offer in 2015 - 2016	Y 1st	sem			Examination	Dec			
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	В	course learning outcomes. Show strong analytical and critical abilities and logical thinking, with evidence of origina thought, and ability to apply knowledge to a wide range of complex, familiar and unfamiliar situations. Apply highly effective organizational and presentational skills.							
	C Demonstrate general but incomplete command of knowledge and skills required for attaining most of the cours learning outcomes. Show evidence of some analytical and critical abilities and logical thinking, and ability to app 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 lea outcomes. Show evidence of some coherent and logical thinking, but with limited analytical and critical abilities. I limited ability to apply knowledge to solve problems. Apply limited or barely effective organizational presentational skills.							
	Fail	Demon				e organizational ar			
		outcom	strate little or no evidence of comma les. Lack of analytical and critical abiliti dge to solve problems. Organization an	ies, logical and coherent t	hinking. Show very little	g the course learnir			
Course Type	Lecture-b	outcom	nes. Lack of analytical and critical abiliti dge to solve problems. Organization an	ies, logical and coherent t	hinking. Show very little	g the course learning or no ability to app			
Course Teaching		outcom knowle	nes. Lack of analytical and critical abiliti dge to solve problems. Organization an	ies, logical and coherent t	hinking. Show very little	g the course learning or no ability to app			
Course Teaching	Lecture-b	outcom knowled ased cou	nes. Lack of analytical and critical abiliti dge to solve problems. Organization an	ies, logical and coherent t id presentational skills are	hinking. Show very little	g the course learning or no ability to appoint of the course learning or no ability to appoint or no ability t			
Course Teaching	Lecture-b	outcom knowle	nes. Lack of analytical and critical abiliti dge to solve problems. Organization an	ies, logical and coherent t id presentational skills are	hinking. Show very little	g the course learning or no ability to appreffective.			
Course Teaching	Lecture-b Activitie Lectures	outcom knowle	nes. Lack of analytical and critical abilitidge to solve problems. Organization an	ies, logical and coherent t id presentational skills are	hinking. Show very little	g the course learning or no ability to appreffective. No. of Hour			
Course Teaching & Learning Activities Assessment Methods	Lecture-b Activitie Lectures Tutorials	outcom knowle ased cou	nes. Lack of analytical and critical abilitidge to solve problems. Organization an	ies, logical and coherent t id presentational skills are	hinking. Show very little minimally effective or in final Asse	g the course learning or no ability to appreffective. No. of Hour			
Course Type Course Teaching & Learning Activities Assessment Methods and Weighting	Lecture-b Activitie Lectures Tutorials Reading	outcom knowle	nes. Lack of analytical and critical abilitidge to solve problems. Organization an	Details Weighting in course grade	final Asse	g the course learning or no ability to appreffective. No. of Hour 3 10 ssment Method			
Course Teaching & Learning Activities Assessment Methods	Lecture-b Activitie Lectures Tutorials Reading Methods	outcom knowle assed cours. / Self stu	nes. Lack of analytical and critical abilitidge to solve problems. Organization an arrse Idy Details Coursework (assignme	Details Weighting in course grade	final Asse (%)	g the course learning or no ability to appreffective. No. of Hour 3 1 10 ssment Method to CLO Mappin			
Course Teaching & Learning Activities Assessment Methods	Lecture-b Activitie Lectures Tutorials Reading Methods Assignm Examina Jean Jaco	outcom knowle ased could ased cou	ues. Lack of analytical and critical abilitidge to solve problems. Organization and urse udy Details Coursework (assignme tutorials, and a class test)	Details Weighting in course gradents, and course g	final Asse (%) 50 CL inger-Verlag,	g the course learning or no ability to appreffective. No. of Hour 3 1 10 ssment Method to CLO Mappin O 1,2,3,4			

STAT7611 Computation	nal statistics (6 credits)	cs (6 credits) Academic Year 201					
Offering Department	Statistics & Actuarial Science	Science Quota					
Course Co-ordinator	Dr G Tian, Statistics & Actuarial Science (gltian@hku.hk)	Dr G Tian, Statistics & Actuarial Science (gltian@hku.hk)					
Teachers Involved	Dr G Tian, Statistics & Actuarial Science						
Course Objectives	This course aims to give undergraduate and postgraduate stud computationally-intensive methods in statistics. It emphasizes t tool of discovery in data analysis, of statistical inference, and methods.	he role of computation a	is a fundamenta				

Course Contents & Topics	Monte 0	Contents include: Numerical optimization and integration, EM algorithm and its variants, Simulation and Monte Carlo integration, Importance sampling and variance reduction techniques, Markov chain Monte Carlo methods, and Bootstrap methods.							
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, Monte Carlo integration and bootstrapping methods								
	CLO 2 realize the advantages and disadvantages of the Newton-Raphson algorithm and the Fisher scoring algorithm and apply them to fit generalized linear models								
	CLO 3	CLO 3 understand the essence and basic principle of the EM-type algorithms and MM-type algorithms, realize their range of application, and apply them to solve practical problems							
	CLO 4	O 4 apply EM-type algorithms to find the posterior mode and apply Markov chain Monte Carlo methods to generate posterior samples							
	CLO 5		ootstrap methods to obtain es of parameters for both paramet				and confidence		
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	STAT360	0 Linear statistical analysis or S	TAT3907	Linear models	and forecasting			
Offer in 2015 - 2016	Y 1:	st sem			Ex	amination	Dec		
Offer in 2016 - 2017	Υ								
Course Grade	A+ to F								
Grade Descriptors	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 require outcomes. Show evidence of some coherent and logical thinking, but with limited ability to apply knowledge to solve problems. Apply limited presentational skills.					ited analytical and cri	tical abilities. Show		
	Fail						r no ability to apply		
Course Type	Lecture-	based co	urse						
Course Teaching	Activit	ies		Details			No. of Hours		
& Learning Activities	Lecture	es					36		
	Tutoria	ls					12		
	Readin	g / Self st	udy				100		
Assessment Methods and Weighting	Method	ds	Details		eighting in fina ourse grade (%		ment Methods CLO Mapping		
	Assigni	ments	Coursework (assignme practical work, and a term test		50	CLO 1	,2,3,4,5		
	Examin	ation	One 2-hour written examination	n	50	CLO 1	,2,3,4,5		
Required/recommended reading and online materials	iterative Givens,	Computa G.H. and	L. and Ng, K.W: Bayesian Mis tion (Chapman & Hall/CRC, Bo Hoeting, J.A.: Computational St Casella, G.: Monte Carlo Statist	ca Raton, tatistics (V	2010). Viley, 2005)	-			
Course Website	moodle.	hku.hk			-				

STAT7614 Advanced statis	tical modelling (6 credits)	Academic Year	2015			
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 SAS or R.					
Course Contents & Topics	It will cover both the underlying principles of each modelling approach model estimation procedures. Topics from: (i) Generalized linear models; (iii) Nonparametric and semi-parametric methods: kernes selection of smoothing parameters; (iv) Additive models; semi-paradditive models; and (v) General issues of model selection: AIC, BIC and the semi-parameters is a selection of semi-parameters.	odels; (ii) Random ef l and local polynoi rametric mixed mod	fects and mixed mial regression;			
Course Learning Outcomes	On successful completion of this course, students should be able to:					

	CLO 1 und	dersatnd the definition and basic cha	racteristics of each	statistical model					
	CLO 2 idea	ntify for a given set of data the most	suitable statistical	model and tools to us	se				
	invo	CLO 3 develop skills of building a scoring model for various management and prediction, problems involving a binary response; employing the powerful tool of kernel density estimation using SAS or R for real data mining problems; and analysing data with SAS procedures PROC LOGISTIC, PROC GENMOD, PROC GLM, PROC UNIVARIATE (option KERNEL) or equivalent R Packages							
Pre-requisites (and Co-requisites and Impermissible combinations)		Pass in STAT3600 Linear statistical analysis							
Offer in 2015 - 2016	Y 2nd s	Y 2nd sem Examination May							
Offer in 2016 - 2017	Υ			'	'				
Course Grade	A+ to F								
Grade Descriptors		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.							
	-								
		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-base	ed course							
	Activities		Details		No. of Hours				
	Activities Lectures		Details						
	1 10 11 11 11 10 1		Details		No. of Hours 36				
	Lectures	Self study	Details		36				
& Learning Activities Assessment Methods	Lectures Tutorials	Self study Details	Details Weighting course gr		36 12 100 essment Methods				
& Learning Activities Assessment Methods	Lectures Tutorials Reading / S	Details Coursework (assignments	Weighting course gr	ade (%)	36 12 100 essment Methods				
& Learning Activities Assessment Methods	Lectures Tutorials Reading / S Methods	Details Coursework (assignments class test(s))	Weighting course gr	50 C	36 12 100 essment Methods to CLO Mapping				
Course Teaching & Learning Activities Assessment Methods and Weighting Required/recommended reading and online materials	Lectures Tutorials Reading / S Methods Assignment Examination 1. Textbook 2. Textbook	Details Coursework (assignments class test(s))	Weighting course gr and on r Models (2nd ed.), etric and Semi-para	50 C 50 C Wiley metric Models. Spring	36 12 100 essment Methods to CLO Mapping LO 1,2,3				

STAT7615 Advanced quant	titative ri	isk mana	gement and finar	ce (6 credits)	Academic Year	2015		
Offering Department	Statistics	Statistics & Actuarial Science Quota						
Course Co-ordinator	Prof W k	Prof W K Li, Statistics & Actuarial Science (hrntlwk@hku.hk)						
Teachers Involved		Prof W K Li, Statistics & Actuarial Science Dr J Song, Statistics & Actuarial Science						
Course Objectives	finance	This course covers statistical methods and models of importance to risk management and finance at finance theory to market practice via statistical modeling and decision making. Emphases will be empirical analyses to address the discrepancy between finance theory and market data.						
Course Contents & Topics	of option	Basic Monte Carlo and Quasi-Monte Carlo Methods; Variance Reduction Techniques; Simulating the va of options and the value-at-risk for risk management; Review of univariate volatility models; multivari volatility models; Stochastic interest rate models; Extreme value theory for risk management.						
Course Learning Outcomes	On successful completion of this course, students should be able to:							
	CLO 1 apply Monte Carlo methods to determine the value of options and other derivative securities							
	CLO 2 predict volatility of a set of securities using appropriate models							
	CLO 3 estimate the value-at-risk under extreme value theory							
Pre-requisites (and Co-requisites and Impermissible combinations)	Pass in	STAT4608	3 Market risk analysis					
Offer in 2015 - 2016	Y 2r	2nd sem			Examination	May		
Offer in 2016 - 2017	Υ							

Course Grade	A+ to F								
Grade Descriptors	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	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	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								
	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	sed co	urse						
Course Teaching & Learning Activities	Activities	Activities			Details No				
& Learning Activities	Lectures	Lectures				36			
	Tutorials	Tutorials				12			
	Reading /	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			
	Examinati	Examination One 2-hour written examinat		n	75	CLO 1,2,3			
Required/recommended reading and online materials	Glasserma Danielsson McNeil, A.	ELeish, Don L.: Monte Carlo Simulation & Finance. (Wiley, 2005). Basserman, Paul: Monte Carlo Methods in Financial Engineering. (Springer, 2003). Inielsson Jon: Financial Risk Forecasting (Willy 2011) ENeil, A. J., Frey, R. & Embrechts, P.: Quantitative Risk Management (Princeton, 2005) Bay, R.S.: Analysis of Financial Time Series (Wiley, 2010, 3rd edition)							
Course Website	moodle.hki	u.hk							

Useful contacts and websites

SCIENCE

Useful contacts and websites

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(Please visit http://www.scifac.hku.hk for the latest updates of BSc courses, timetables, notices and forms)

Departments/School

Biological Sciences Website : http://www.biosch.hku.hk
Biomedical Sciences Website : http://www.sbms.hku.hk
Chemistry Website : http://www.chemistry.hku.hk
Earth Sciences Website : http://www.earthsciences.hku.hk

MathematicsWebsite: http://www.math.hku.hkPhysicsWebsite: http://www.physics.hku.hkStatistics and Actuarial ScienceWebsite: http://www.saasweb.hku.hk

Academic Advising Office Tel : 2219 4686

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 : http://commoncore.hku.hk

HKU Worldwide Undergraduate

Exchange Programme

Website : http://www.als.hku.hk/admission/exchange

Centre of Development and Tel : 2859 2305

Resources for Students (CEDARS) Website : http://cedars.hku.hk

University Health Service Tel : 2859 2501 (General enquiries)

2549 4686 (Medical appointments only)

Website : http://www.uhs.hku.hk

Plagiarism Website : http://www.hku.hk/plagiarism